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Cinematographer

OCTOBER 1960 • 35¢

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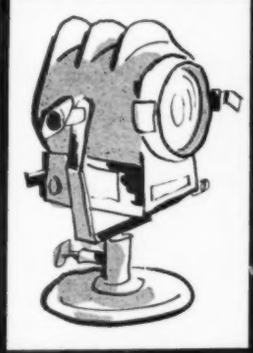

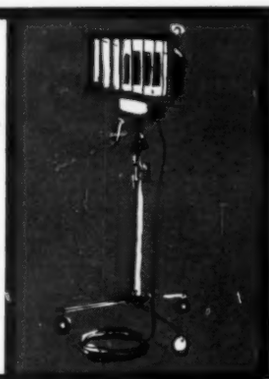

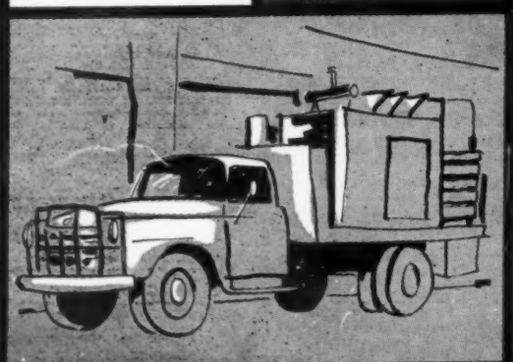

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AMERICAN

Cinematographer

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October, 1960 **Vol. 41, No. 10**

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ON THE COVER

Shooting scene at Honolulu International Airport for "Hawaiian Eye," popular TV film series produced by Warner Brothers. Story about the photography appears in this issue.—Aloha Airlines photo by Walt Pollock.

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FOUNDED January 8, 1919, the ASC was established to advance the art and the science of cinematography; to encourage, foster, and strive for preeminence, excellence, artistic perfection and scientific knowledge in all matters pertaining to cinematography; to bring into closest confederation those leaders in the cinematographic science whose achievements in that field entitle them to membership in the Society; and to promote the interests of all who shall be called to membership in the ASC, that such membership may become a mark of honor and distinction based on merit.

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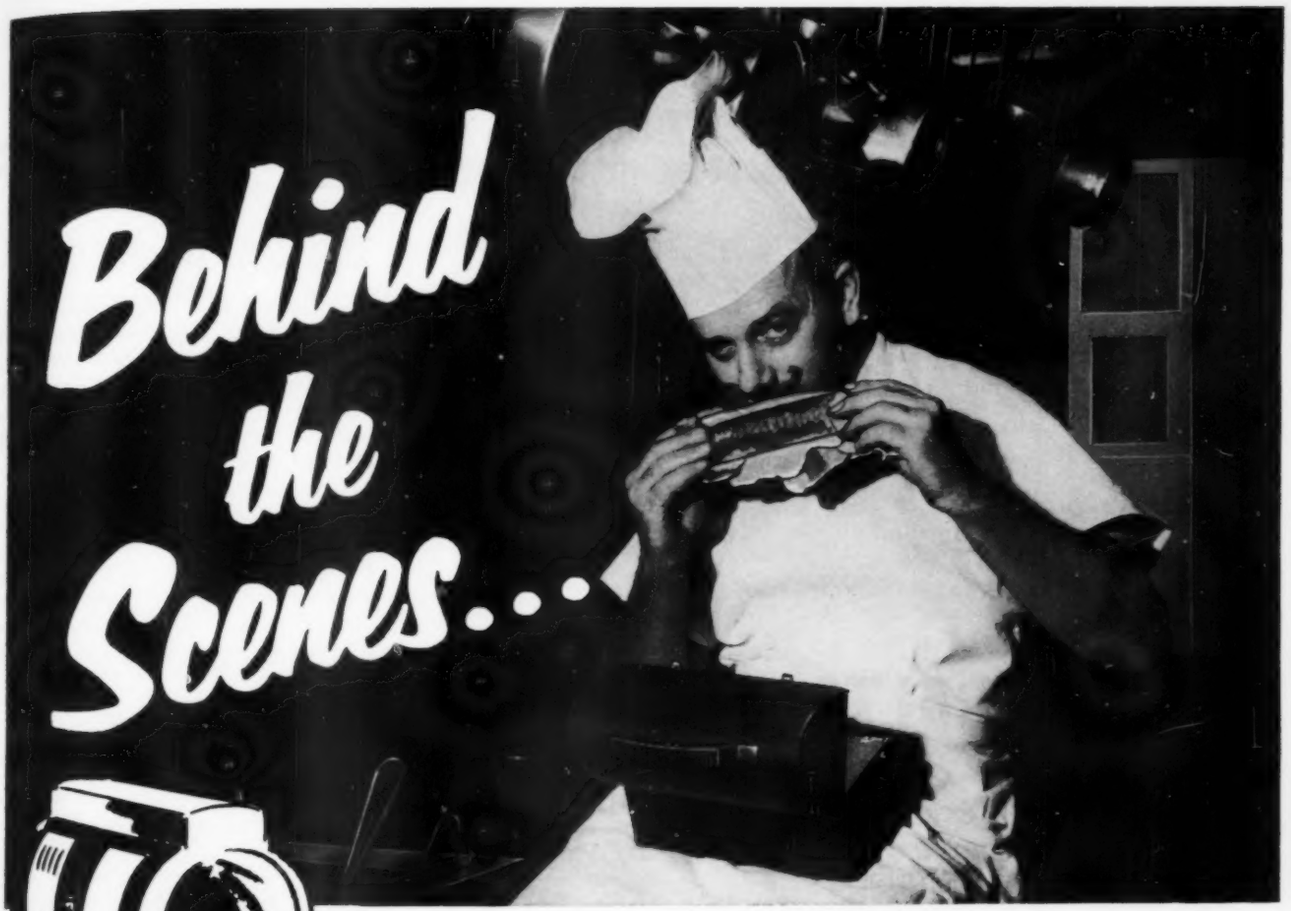

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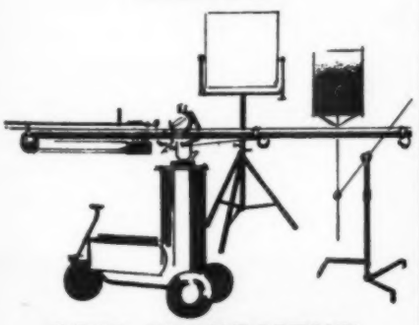

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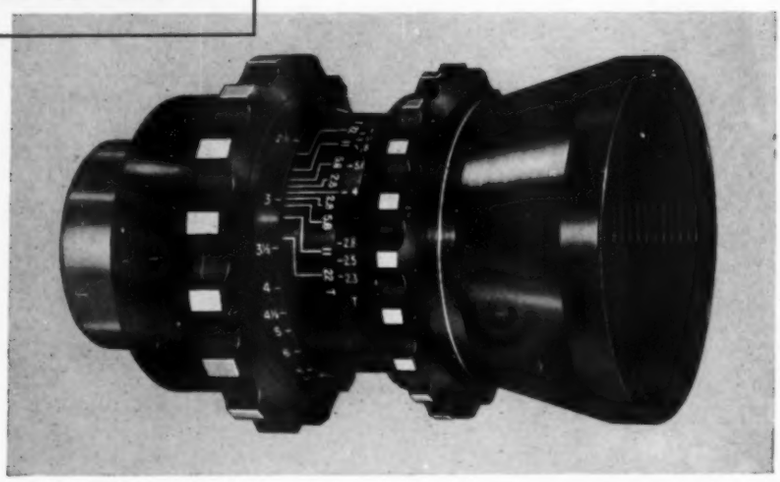

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INDUSTRY NEWS

NEWS BRIEFS OF INDUSTRY ACTIVITIES, PRODUCTS AND PROGRESS

Bright Future Ahead

Declaring that the motion picture industry faces a brighter future today than at any time in recent years, Jack L. Warner announced last month that Warner Brothers studio will step up feature film production immediately. Fifteen films are ready to roll.

Warner also cited the emergence of television as a full-fledged partner of theatrical motion pictures. At Warner Brothers studio, technicians and production staffs as well as performers are interchangeable between the two mediums and the same production facilities are utilized.

* * *

When Tahiti Calls MGM

Robert Surtees, ASC, who will direct the photography of MGM's "Mutiny on the Bounty" in Tahiti, will also serve as radio contact man with the studio. Surtees, long an amateur radio operator with elaborate shortwave equipment in his home, is taking the equipment with him to Tahiti.

* * *

Hollywood Animation Studios Financing College Training

Twenty animation studios in Hollywood have contributed cash and technical men to assist in the establishment of a course in professional animation at University of Southern California, Los Angeles.

Move is aimed toward solving present shortage of trained animation per-

Continued on Page 584

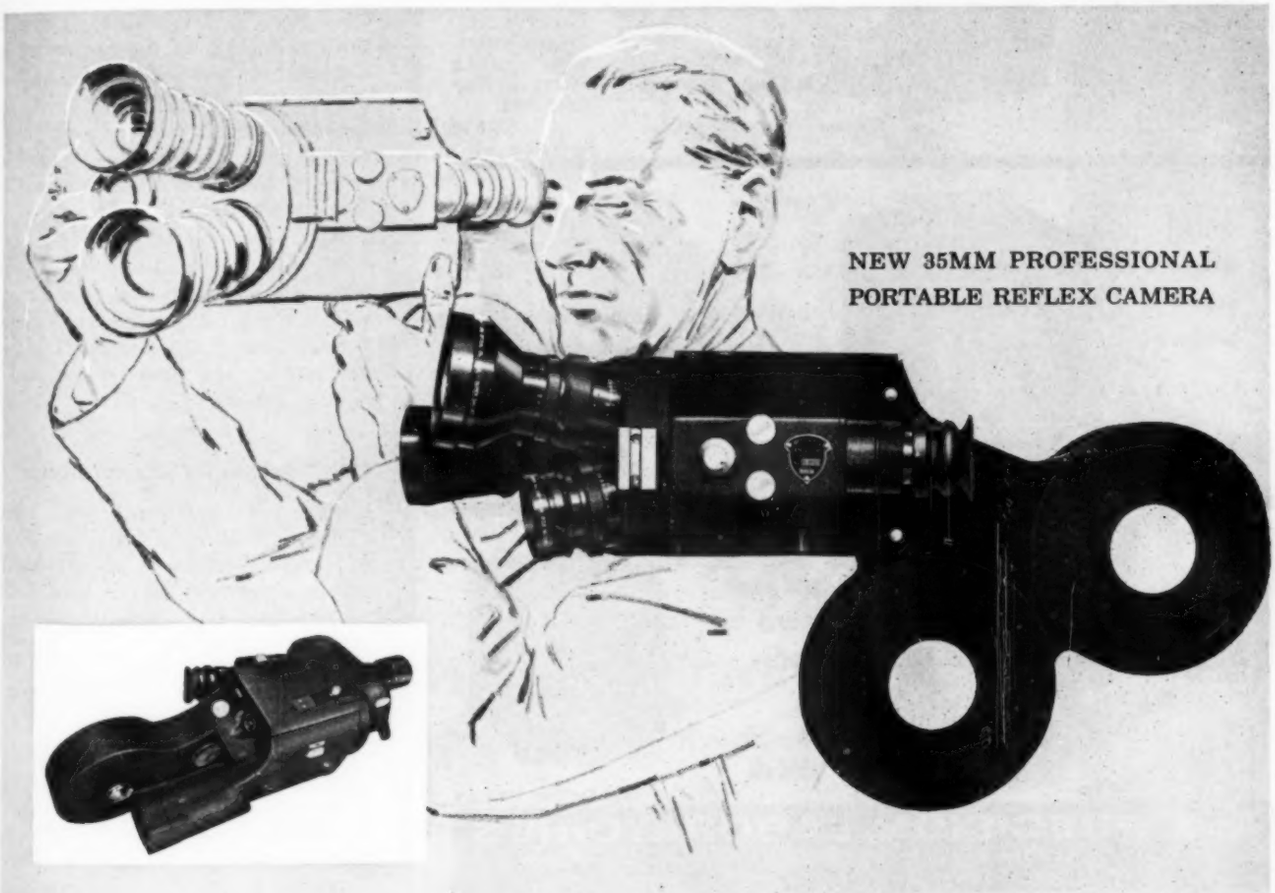
WALTER STRENGE, ASC, displays medallion presented him last month by the Academy of Television Arts and Sciences on the occasion of his retirement as a governor of the Society. Two retiring trustees and five other governors were similarly honored.

NEW

MITCHELL R-35 *Reflex*

Hand Held or Tripod Mounted*

Here for the first time *is a 35mm reflex motion picture camera which combines streamlined lightweight design with the full range of professional features. Its superbly engineered design by Mitchell—the world's leading source of professional motion picture cameras—assures a remarkable versatility in filming. Among the broad capabilities of the R-35 are: theatrical and television productions—on location and in the studio; underwater use; high speed instrumentation films; and both animation and stop-motion.*



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PORTABLE REFLEX CAMERA

This camera produces steady, brilliant pictures through its use of dual registration pins and dual pull-down claws. A special series of Super Baltar matched F 2.0 lenses were specifically designed for the R-35 by Bausch & Lomb. Variable opening disc shutter provides positive exposure control. By means of a simple adaptor the R-35 can be used with standard Mitchell 1000′ magazines for tripod mounting. These are but a few of the outstanding professional features that make the Mitchell R-35 a major cinematic development. Send for the new R-35 Bulletin. *Tripod adaptor and blimp available as accessories.

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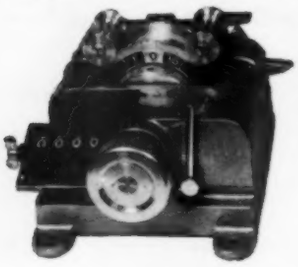

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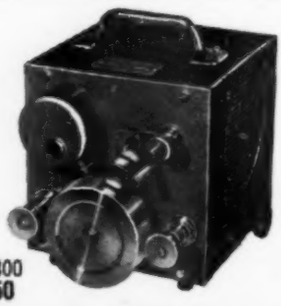

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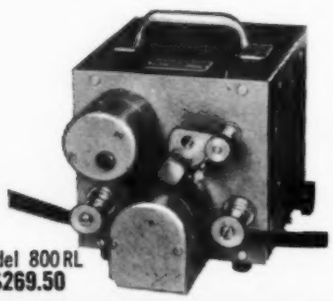

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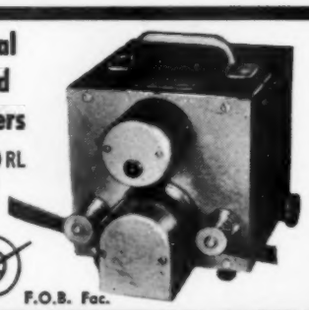

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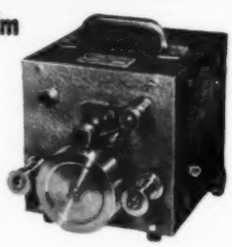

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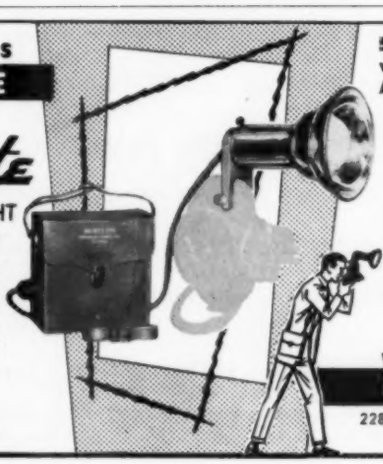

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INDUSTRY NEWS

Continued From Page 582

sonnel in the production of animated sequences for TV commercials, features and documentary films.

Courses were begun September 19th at the University's Department of Cinema, 659 West 35th St., Los Angeles.

* * *

SMPTE's 5th High Speed Congress In New York, October 16 to 22

The Fifth International Congress on High Speed Photography will be held October 16th to 22nd at the Sheraton Park Hotel in Washington, D.C., under the sponsorship of the Society of Motion Picture and Television Engineers.

Program will deal with miscellaneous applications of High Speed photography, materials for same, applications of light, use in ballistics, cameras used for HS photography, and control systems.

The technical papers to be presented have been solicited from among the top scientists and engineers in U.S. and foreign countries. Delegates from twenty countries are expected to attend the six-day confab.

* * *

Howe Debuts As Screen Director

James Wong Howe, ASC, veteran Hollywood Director of Photography, is set to direct an as yet untitled feature production for Associated Producers, Inc., which will be released by 20th Century-Fox.

* * *

NBC-TV Pushing Color

"Color TV Day—U.S.A." will be celebrated by the NBC-TV Network on November 11. The network has announced it will increase its color telecasts by 40% to 50% for the 1960-61 season.

While there was no announcement as to how much of this programming will be on film, it is expected that NBC-TV, with heavy interests in video film production, will substantially increase use of color film in its color programming expansion. The network's engineers have made many noted contributions toward the perfection of color-casting with film. ■

8MM SOUND

The second article dealing with use of 8mm sound films in industry and science, promised for this month, will appear in the November issue of *American Cinematographer*.

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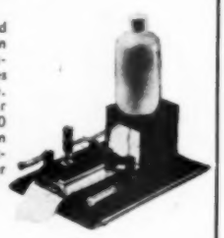

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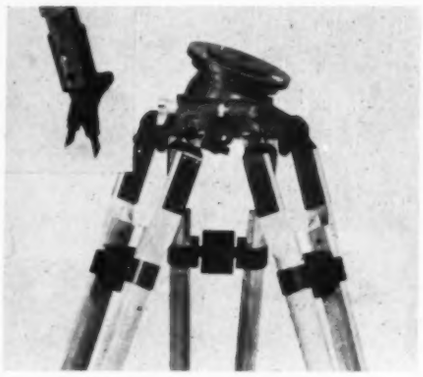
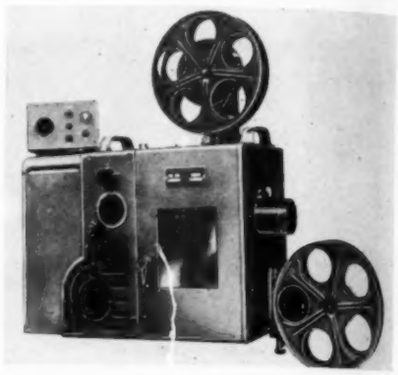


GyroSphere Junior Tripod

S.O.S. Cinema Supply Corp., 602 West 52nd St., New York 19, N.Y., announces its ball-socket GyroSphere Junior Tripod which provides a secondary leveling medium whenever camera is used on an un-level floor or rough exterior terrain.

A single bulls-eye spirit level shows top plate is level, and plate may be adjusted and locked in position instantly. Either friction or fluid tripod heads may be used on the GyroSphere and worked independently of it. An additional feature is the twin-point shoes (inset) and one-piece leg locks.



35mm Stop-motion Projector

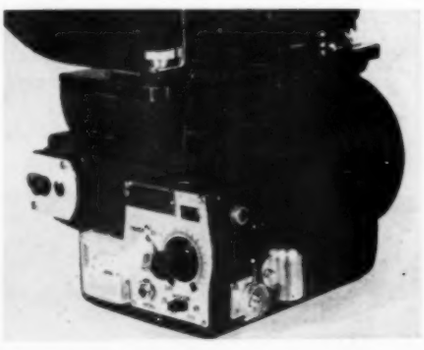
Camera Equipment Co., Inc., 315 West 43rd St., New York 36, N.Y., announces a 35mm analyst stop-motion projector designed for use in studying 35mm technical motion picture records, including those filmed in high-speed, normal, or slow-motion.

It features variable speed from 8 to 24 pps, both forward and reverse, positive single-frame operation, frame counter, 1000-ft. reel arms, and positive frame registration, plus or minus .0005 inches.

Two aperture sizes are available: .825 by .600 inches or .680 by .970 inches. Lens is 3½" focal length with f/1.9 aperture. Lamp is 1000-watt.

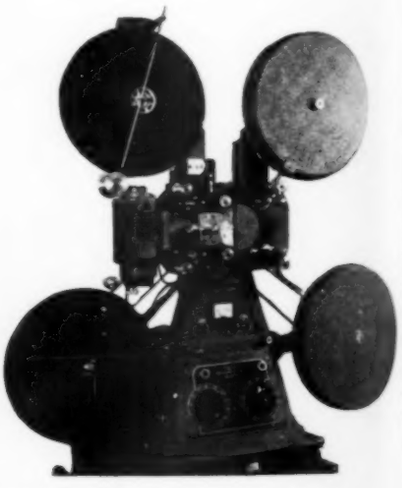
Fast Zoom For Arri-16

Arriflex Corp. of America, 257 Park Ave. South, New York 10, N.Y., announces a new Pan Cinor zoom lens for the Arriflex-16. Focusing range is 17.5mm to 85mm, aperture f/2. Zoom movement is lever operated and provides extremely smooth operation and will focus down to 6 feet.



Transistorized S.O.F.

Transist-O-Sound, 851 Eustis, Indianapolis 19, Indiana, offers complete one- and two-channel transistorized sound on film amplifier units for Auricon cameras. Units feature wide-range audio and are licensed by RCA. The one- and two-channel amplifiers are mounted beneath the camera as shown in photo above. More complete details and prices may be had by writing company at above address.



Film Printers

Uhler Cine Machine Co., 15762 Wyoming Ave., Detroit 38, Mich., announces important improvements in the company's line of film printing machinery, which includes a Microfilm/Stripfilm printer for 16mm or 35mm, combination 16mm continuous printer, 16mm-to-8mm/8mm-to-16mm optical printer, combination 35mm continuous printer, and a 35mm/16mm optical reduction printer. Specification and price sheets are available on all models by writing the company direct.

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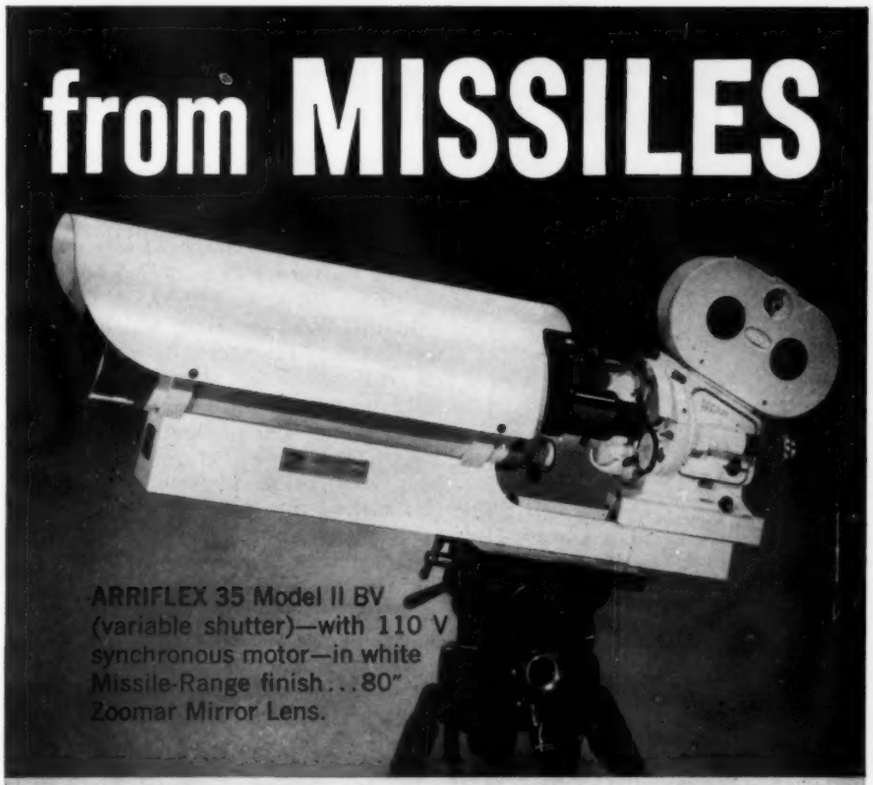

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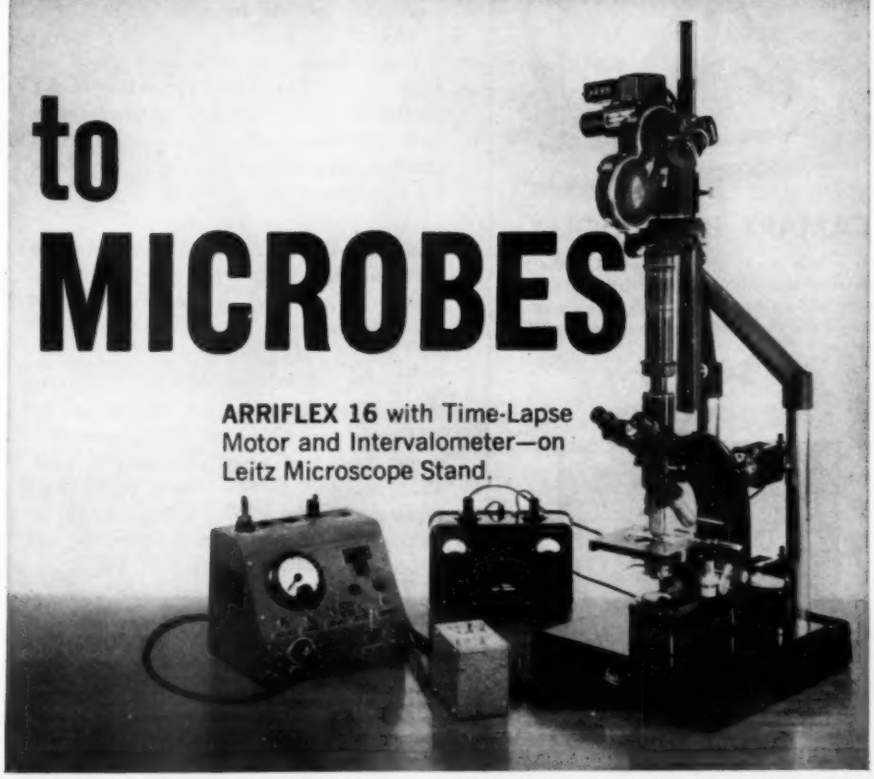

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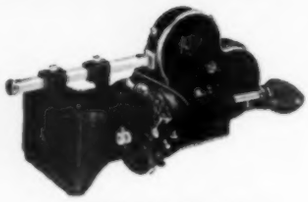

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NEW BOOK REPORTS

Theory Of Film, *by Siegfried Kracauer. Oxford University Press, 417 5th Ave., New York 16, N. Y. $10.00.*

In this 364-page book which bears the subtitle, "The redemption of physical reality," author Kracauer covers just about every aspect of black-and-white film. He discusses its background in still photography, the problems inherent in historical and fantasy motion picture films, the novel as a cinematic form, experimental films, documentaries, the role of the actor, the use of dialogue and sound, the contribution of music, and the part played by the spectator.

As the author states in the Preface, "It would be fair to advise the reader at the outset that this book does not include all the things he may be looking for. It neglects the animated cartoon and avoids broaching problems of color."

Paul Rotha considers *Theory of Film* ". . . The most important work in the English language on the theory and aesthetics of the Film. It will make a deep impact in all places where the Cinema is regarded as an art."

The Film Daily Year Book of Motion Pictures for 1960. *Chester B. Bahn, Editor. Published by The Film Daily, 1501 Broadway, New York 36, N. Y. $15.00.*

The fact 25 pages of this book are devoted to its editorial content alone indicates something of the tremendous scope and content of this annual publication which has been published annually since 1917. Obviously, it is impossible to set down here a full description of its contents.

The Film Daily Yearbook will be found on the desks of every important person in the film industry, the exhibitor field, and in the realm of publishing where quick reference to a source of authentic information concerning film titles, players, technical credits, industry personnel, and other such facts are required.

Subscribers to *Film Daily* receive one copy of the year book gratis as part of their subscription to the daily publication.

Control Techniques In Film Processing, *published by the Society of Motion Picture and Television Engineers, 55 West 42nd St., New York 36, N. Y. $5.00.*

The publication of "Control Techniques" marks the culmination of two years of effort by a special subcommittee of the SMPTE's Laboratory Practice Committee. The authoritative information contained in the book, assembled for the first time in one volume, should serve as a guide to improved film processing in the industry.

The 181-page illustrated book is designed for persons engaged in film processing in laboratories serving motion picture, television and the many specialized fields such as high-speed and instrumentation photography.

The book includes discussions of the general principles of process control; general aspects of motion picture film processing; mechanical evaluation and control; instruments for photographic control; control strips and sensitometric control of a standardized process; the chemistry of film processing; and chemical analysis and control. Each of the ten chapters of the book is written by a recognized specialist in some definite phase of film processing.

ABC of Film and TV Working Terms, *by Oswald Skilbeck, Hastings House, Publishers, Inc., 151 East 50th St., New York 22, N. Y. $3.95.*

A dictionary designed to explain the working words used in British film and television studios. Some of the words are more technical than others; some naturally stem from casual slang. Whatever their original, the reader is offered compact and colloquial explanations of what is meant by them. Thus it is an easy guide to understanding what another man in the studio says and to make the reader properly understood by him.

The compiler of this book is the managing director of a London film production company, whose working experience extends to many studios abroad. The terminology is essentially British—although it is obvious enough how many terms are of transatlantic origin. Yet the American film worker is likely to find, somewhat to his surprise, that words which strike him as having a homely flavor have acquired new meaning in British studios. Author Skilbeck originally collected these words and added explanations to them for the benefit of his own apprentices, later enlarged its scope.

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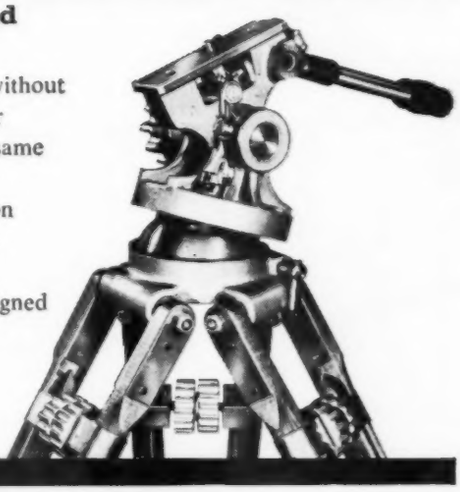

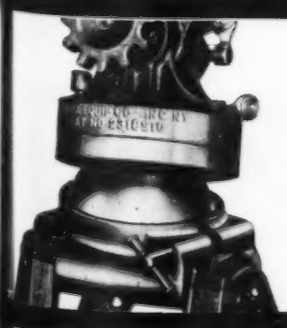

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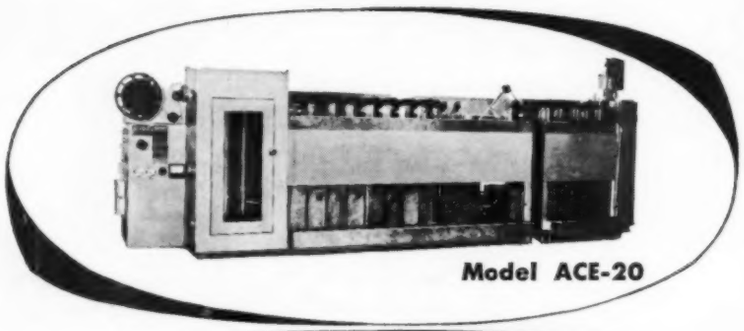

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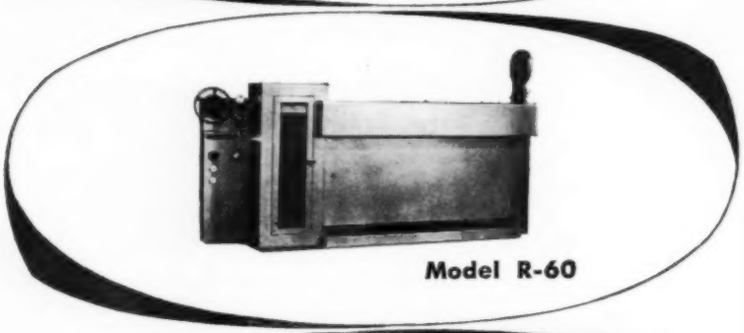

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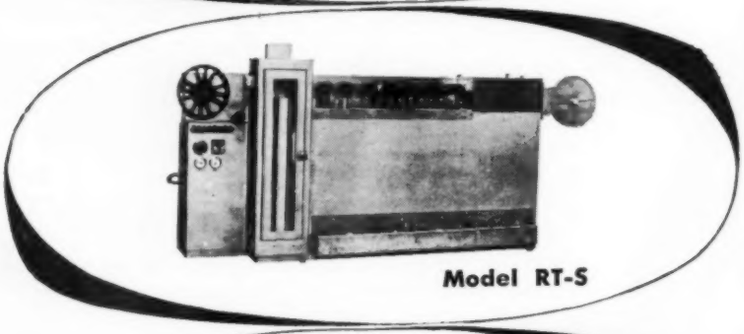

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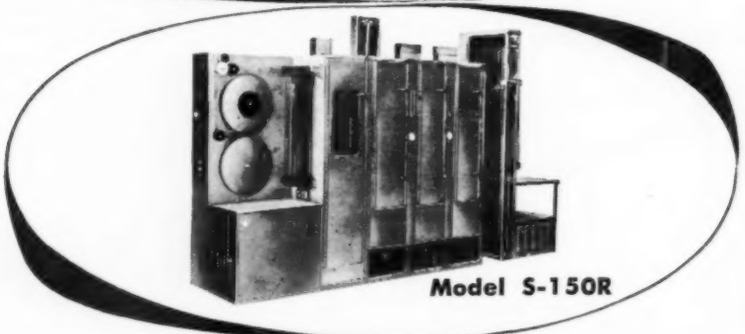

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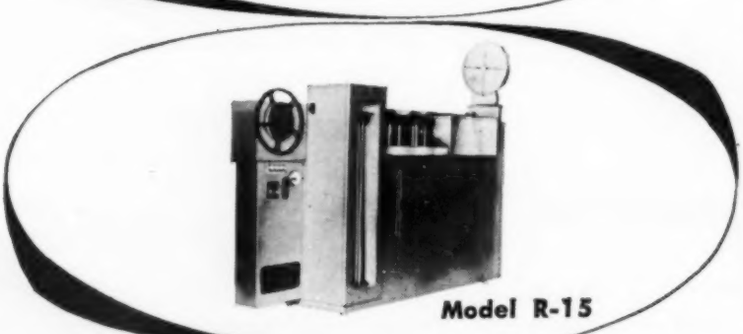

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316 DS	Neg/Pos.	B&W	16mm	60 FPM
416 D	Neg/Pos.	B&W	16mm	80 FPM
N	Neg/Pos.	Microfilm	16/35mm	8 FPM
L	Neg/Pos.	B&W	16/35mm	8 FPM
RN 16/35	Neg/Pos.	B&W	16/35mm	24 FPM
RN 16/35mm	Neg/Pos.	Microfilm	16/35mm	24 FPM
316D35	Neg/Pos.	B&W	16/35mm	32 FPM
316D35M	Neg/Pos.	Microfilm	16/35mm	32 FPM
416D35	Neg/Pos.	B&W	16/35mm	80 FPM
PN100	Neg/Pos.	B&W	16/35mm	100 FPM
S 150-R	Neg/Pos.	B&W	16/35mm	150 FPM
470 ND	Neg/Pos.	B&W	70mm	10 FPM
35ND70	Neg/Pos.	B&W	35/70mm	30 FPM
70R10	Reversal	B&W	70mm	10 FPM
R 15	Rev & Neg/Pos.	B&W	16mm	15 FPM
R15TC	Rev & Neg/Pos.	B&W	16mm	15 FPM
R40	Rev & Neg/Pos.	B&W	16mm	25 FPM
R40TC	Rev & Neg/Pos.	B&W	16mm	25 FPM
RT-S	Rev & Neg/Pos.	B&W	16mm	85-125 FPM
R-60	Rev & Neg/Pos.	B&W	16mm	30 FPM
R-17-35	Rev & Neg/Pos.	B&W	16/35mm	17 FPM
R-60S	Rev & Neg/Pos.	B&W	16mm	60 FPM
R-90	Rev & Neg/Pos.	B&W	16mm	90 FPM
CN-10	Eastman Neg Ektacolor	Color	46mm	12 FPM
CN35-10	Eastman Neg Ektacolor	Color	35/46mm	12 FPM
ENP-25	Eastman Neg	Color	16/35mm	25 FPM
ACE 20	Ansco/Ektachrome 7255 Ektachrome Eastman SO 260 SO 270	Color	16mm	22 FPM
ACE 40	Ansco	Color	16mm	36 FPM
16KC-60	Kodachrome	Color	16mm	60 FPM
35KC-45	Kodachrome	Color	16mm 35mm	45 FPM 8 FPM

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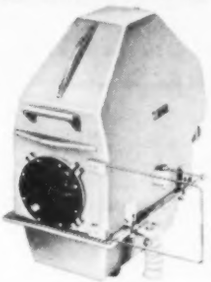

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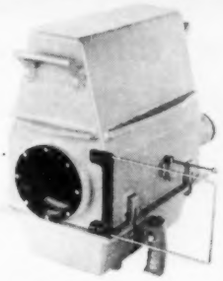

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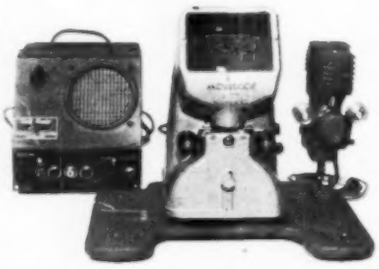

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WALTER STRENGE'S

QUESTIONS & ANSWERS

Need advice on a picture making problem? Your questions are invited and will be answered by mail. Questions and answers considered of general interest will appear in this column each month.

Q In making titles for Kodachrome films, I have expended some 800 feet of color film in trial-and-error experiment in producing satisfactory superimposed titles.

There must be a way to achieve clean-cut lettering over art work without one bleeding into the other. In lecture work, I use original prints of film only. Dupes suffer in contrast, particularly when intercut with an original print.

I have shot titles lettered on virtually every material available. It appears that the film acts as a single plane and back-wind shooting of anywhere from two to ten subjects invariably results in the bleeding of one subject into another.

What, then, is the correct method of shooting combination titles on original Kodachrome?—*H.M.*

Answer: Your problem of shooting superimposed titles on 16mm Kodachrome is a common one, particularly where one wishes to use original material for projection. Usually it is best to follow the methods of producing titles that do not require back-wind and re-exposure.

One method for making good black titles over a transparency is to shoot the title in reverse position on black-and-white film so it may be placed in contact, emulsion to emulsion, with your transparency in a shadow box. In this case, you will employ only the back light through the transparency for exposure.

The most common and perhaps the most satisfactory way of producing titles on Kodachrome is to photograph art for the background with an overlay title done on thin transparent material, using reflected light for exposure.

Still another method is to place the title text on glass, which is set up before the camera in the foreground, with either a transparency or photographed scene in the background. Here excellent balance of exposure is required between both mediums.

Where prints are to be made from the original Kodachrome, the common practice is to combine the titles, separately photographed, with the print or the title background by means of A & B printing.

Q My problem is 16mm splices that show on the screen during projection—especially when a dark scene is joined with a lighter one.—*J.W.K.*

Answer: Having examined the sample splice you submitted, it appears that you are not using a professional type splicer. With 16mm film, you cannot entirely avoid having the splice show on the screen, but its appearance can be greatly minimized by using a splicer such as the Bell & Howell which produces a very narrow splice.

Q What are the procedures involved for producing fades, wipes and lap-dissolves by the A & B roll editing method?—*P.A.K.*

Answer: You'll find the answer in the article in this issue devoted to editing 16mm A & B rolls.

Q Using a Mitchell 35mm NC camera mounted on a helicopter or fixed wing aircraft for aerial photography, is it possible to close the shutter to 10° and operate the camera at 24 fps to take advantage of the 1/864th second exposure as a means of eliminating vibration, without creating a screen jump between each frame due to the extra long time of no exposure between frames?—*W.B.*

Answer: According to Thomas E. Tutwiler, ASC, the answer is no. He says further that in aerial photography the shutter should never be closed beyond 90° at 24 fps, and even with this combination undesirable "stop motion" effects are sometimes obtained. When the action permits, Tutwiler recommends a camera motor speed of 32 fps (175° shutter), which will eliminate most vibration effects when shooting from helicopter or fixed wing aircraft.

Q I am planning a 35mm B&W film with live-action background with a ghost effect superimposed over all. What is the best black material against which to shoot the ghost image, so that I will get the minimum of exposure? The whole optical job is to be done on an Animastand.—*R.P.H.*

Answer: Black velvet is generally considered the best material for backgrounds for ghost effects. Other suitable materials are velveteen, velour, sprayed black flock, etc. If the subject to be photographed against the black material can be made up very light in values and color, an exposure ½ to 1 stop under normal will produce very little if any background density.

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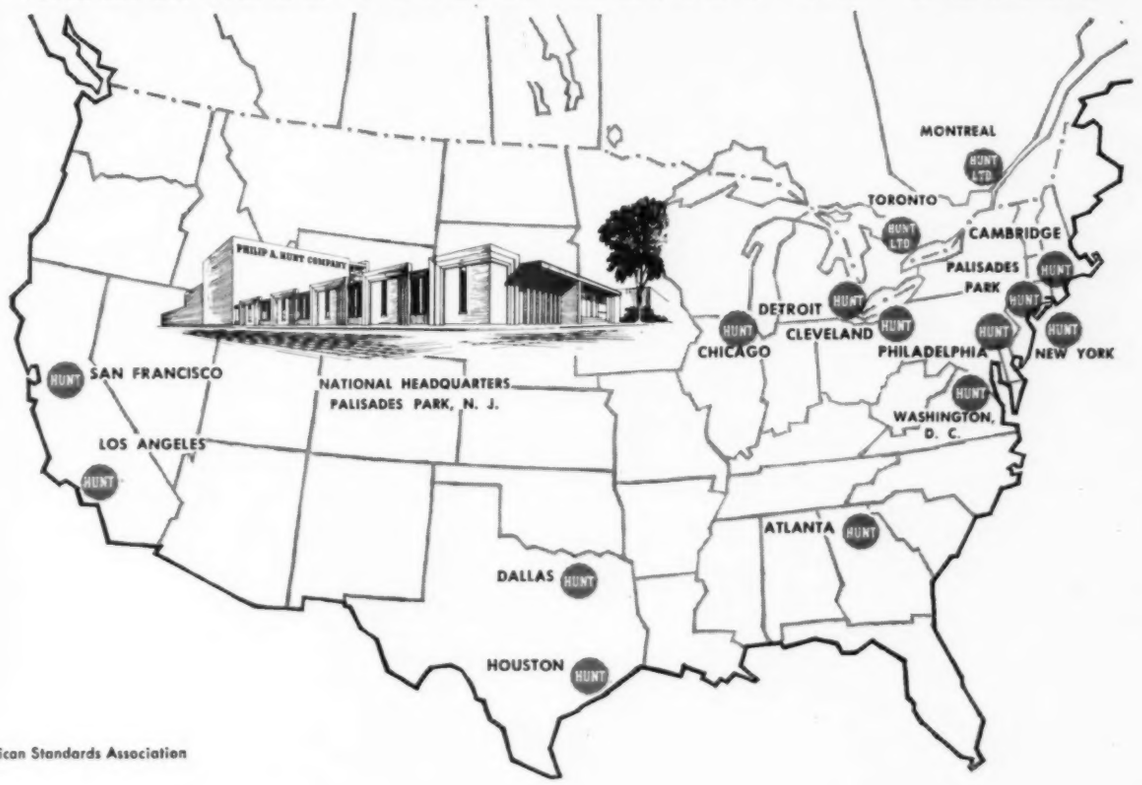

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On location in the heart of the Ghana jungle, Karl Malkames (left), Cameraman, and Gene Boesch (right), Ass't Cameraman (both of the N. Y. IATSE, Local 644), pose for a snapshot. The F & B accessory case in the center is carefully guarded by our new Ghanese vice-president.

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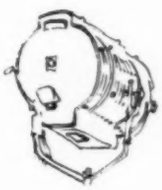

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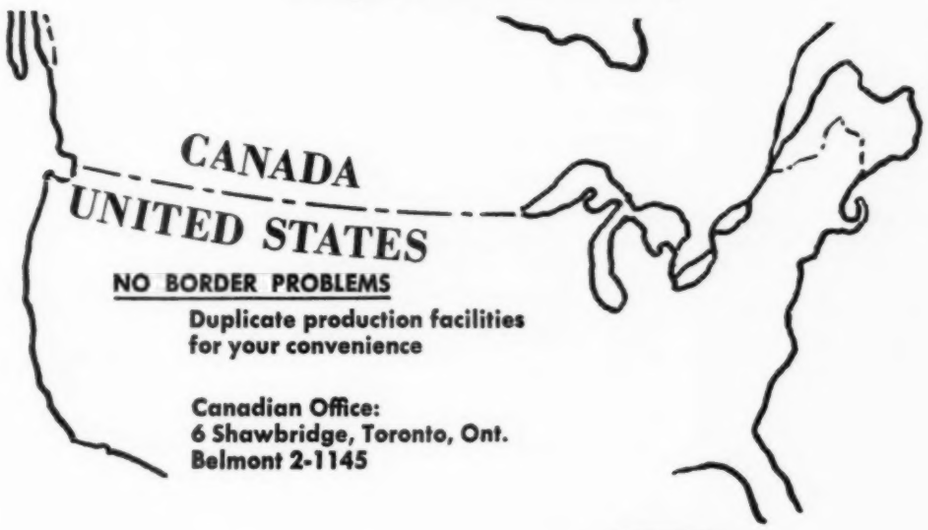

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PHOTOGRAPHIC ASSIGNMENTS

WHAT THE INDUSTRY'S CAMERAMEN WERE SHOOTING LAST MONTH

By MARION HUTCHINS

AMERICAN NATIONAL

MONROE ASKINS, RICHARD RAWLINGS, CURT FETTERS, "Lock-Up"* (Ziv-TV) with MacDonald Carey.

RICHARD RAWLINGS, "The Case of the Dangerous Robin"* (Ziv-TV) with Rich Jason.

BRICK MARQUARD, "Klondike"* (Ziv-TV) with Ralph Taeger.

MONROE ASKINS, "Bat Masterson"* (Ziv-TV) with Gene Barry.

JACK MARQUETTE, MONROE ASKINS, "Acquanaut"* (Ziv-TV) with Keith Larson and Jeremy Slate.

CALIFORNIA STUDIOS

JACK MARQUETTE, "War Hero" (Burt Topper Prods.) with Tony Russell and Baynes Barron. Burt Topper, director.

COLUMBIA STUDIOS

FREDDIE YOUNG, "The Greengage Summer" (Color; P.K.I. Picts.; Shooting in France) with Kenneth Moore and Danielle Darrieux. Lewis Gilbert, director.

WALTER STRENGE, ASC, "Army Reserve Industrial", Jack Daniels, director; Commercials (Screen Gems).

OSWALD MORRIS, "The Guns of Navarone" (Color; Highroad Prod.; shooting in Greece) with Gregory Peck and David Niven. Alexander Mackendrick, director.

WILKIE COOPER, "Mysterious Island" (American Films Prods.; shooting in Spain) with Michael Craig and Joan Greenwood. Cyril Endfield, director.

CHARLES LAWTON, JR., ASC, "A Raisin in the Sun" (Shooting in Chicago) with Sidney Poitier and Claudia McNeil. Daniel Petrie, director.

GERT ANDERSEN, ASC, "Donna Reed Show"* (Screen Gems) with Donna Reed. Andrew McCullough, director.

CHARLES WELBORN, "Manhunt"* (Screen Gems) with Victor Jory and Pat McVey. Fred Jackman, director.

HENRY FREULICH, ASC, "Dennis the Menace"* (Screen Gems) with Jay North and Herbert Anderson.

FRED GATELY, ASC, "My Sister Eileen"* Screten Gems) with Shirley Boone and Elaine Stritch. Oscar Rudolph, director.

WILLIAM WHITLEY, ASC, "Dan Raven"* (Screen Gems) with Skip Homeier and Quinn Redeker.

WILFRID CLINE, ASC
Currently shooting "Stagecoach West," TV film series for 4-Star at Republic Studios.

DESILU—Cahuenga

ROBERT DE GRASSE, ASC, "Angel"* (Desilu Prods.) with Annie Farge and Marshall Thompson. Lamont Johnson, director.

SID HICKOX, ASC, "The Andy Griffith Show"* (Desilu Prods.) with Andy Griffith.

ROBERT DE GRASSE, ASC
Filming "Angel," new TV film series, at Desilu's Cahuenga Blvd. studio.

DESILU—Culver City

CHARLES STRAUMER, "The Untouchables"* (Desilu Pods.) with Robert Stack and Jerry Paris.

LUCIEN ANDRIOT, ASC, ROBERT HAUSER, "Guestward Ho"* (Desilu Prods.) with Joanne Dru and and Mark Miller.

LOTHROP WORTH, ASC, "The Real McCoy's"* (Brennan-Westgate Prods.) with Walter Brennan.

DESILU—Gower

MAURY GERTSMAN, ASC, "Barbara Stanwyck Theatre"* (Desilu Prods.) with Barbara Stanwyck.

CHARLES VAN ENGER, ASC, "Lassie"* (Jack Wrather Prods.) with June Lockhart and Jon Provost.

ROBERT PLANCK, ASC, "My Three Sons"* (Desilu Prods.) with Fred MacMurray and William Frawley.

ROBERT HAUSER, "Wyatt Earp"* (Desilu Prods.) with Hugh O'Brian.

ROBERT PITTACK, ASC, "Ann Sothern Show"* (Desilu Prods.) with Ann Sothern.

LUCIEN ANDRIOT, ASC, "Harrigan and Son"* (Desilu Prods.) with Pat O'Brien and Roger Perry.

WALT DISNEY STUDIOS

LUCIEN BALLARD, ASC, "Petticoats and Bluejeans" with Hayley Mills and Maureen O'Hara. David Swift, director.

WALTER CASTLE, ASC, "Pop Warner Football"*

FOX WESTERN AVENUE

JAMES VAN TREES, ASC, "Dobie Gillis"* with Dwayne Hickman. Rod Amateau, director.

GENERAL SERVICE STUDIOS

FRANK REDMAN, ASC, "Perry Mason"* (CBS-TV) with Raymond Burr and Barbara Hale.

RAY RENNAHAN, ASC
Directing the photography of "Laramie," TV film series produced by Revue.

GOLD MEDAL STUDIOS, N.Y.

JOSEPH BRUN, ASC, "Girl of the Night" (Vanguard Prod. for Warner Bros.) with Anne Francis and Lloyd Nolan. Joseph Cates, director.

GOLDWYN STUDIOS

FLOYD CROSBY, ASC, "Burma Patrol" (Zenith Picts. for UA) with Ron Foster and Miiko Taka. Edw. L. Cahn, director.

INDEPENDENT

HASKELL WEXLER, "The Hoodlum Priest" (Murray-Wood Prod. for UA; shooting in St. Louis) with Don Murray and Larry Gates. Irving Kershner, director.

GEORGE TYSSEN, "No Time to Cry" (Shooting in Austria) with Molly McGowan and Karl Fischer. Dorrell & Stuart McGowan, directors.

GILBERT WARRENTON, ASC, "Master of the World" (Dyna-Magic & Color; American Int'l Picts.) with Vincent Price and Charles Bronson. William Witney, director.

LIONEL LINDON, ASC, "A Matter of Conviction" (Contemporary Prods. for UA; shooting in N.Y.) with Burt Lancaster and Dina Merrill. John Frankenheimer, director.

MILTON KRASNER, ASC, FRANK PLANER, ASC, "King of Kings" (Technicolor, Samuel Bronston Prods.; shooting in Spain) with Jeff Hunter and Robert Ryan. Nicholas Ray, director.

AMERICO HOSS, "The Blonde from Buenos Aires" (color; Continental Films; shooting in Argentina) with Mamie Van Doren and Jean Pierre Aumont. George Cahan, director.

D. STANLEY HORSLEY, ASC, "Jack the Giant Killer" (Technicolor; Edw. Small Prod. for UA) with Kerwin Mathews and Judi Meredith. Jerry Juran, director.

HAL MOHR, ASC, "This Time Tomorrow" (Genie Prods.) with Don Megowan and Frances McCann. Wesley Barry, director.

WILLIAM DANIELS, ASC
Shooting "Come September" in Panavision and Color in Italy for Universal-International.

DANIEL FAPP, ASC, "West Side Story" (Panavision 70 & Color; Mirisch Picts—Seven Arts Prods.; shooting in N.Y.) with Natalie Wood and Richard Beymer. Robert Wise and Jerome Robbins, directors.

RUSSELL METTY, ASC, "The Misfits" (Seven Arts for UA; shooting at Reno) with Clark Gable and Marilyn Monroe. John Huston, director.

EUGENE SHUFTAN, "Something Wild" (Prometheus Prod. for UA; shooting in N.Y.) with Carroll Baker and Ralph Meeker. Jack Garfein, director.

Continued on Page 632

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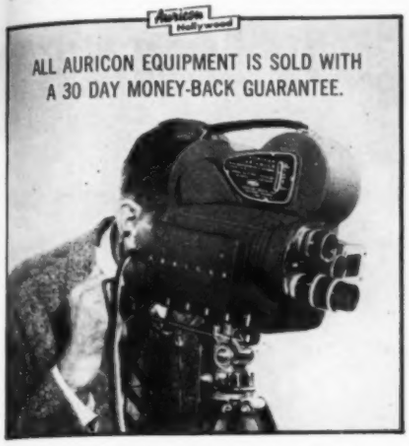

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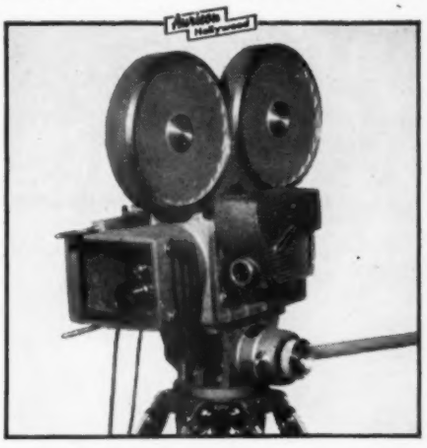

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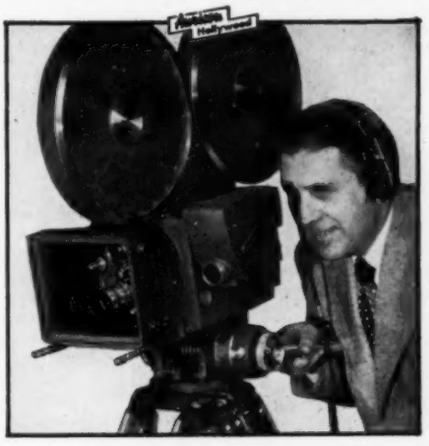

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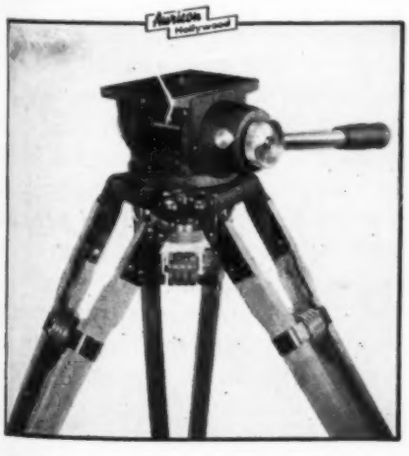

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FIG. 1—THE MINIATURE SEQUENCES in MGM's "The Wreck of the Mary Deare" exemplified the ultimate in special effect techniques. Precise scaling of the miniature "Mary Deare" and use of the latest equipment and techniques to produce wave motion on a compatible scale, made scenes like the one at left highly realistic.

IN OUR APRIL, 1960, issue, Joseph Ruttenberg, ASC, described the preparation and filming of special effects scenes for the M-G-M production, "The Wreck of the Mary Deare." The following article by one of Britain's foremost technical men describes how one of the main problems confronting the special effects technician—that of scale in miniature scenes containing water—has been tackled by a British studio, leading to the formulation of specific rules to aid cameramen and others, and showing how, in certain cases, the problem may be circumvented by the alternative use of travelling mattes.—EDITOR.

THE USE OF MINIATURES in film production is now so well established that it needs no introduction here. What film-maker in his enthusiasm for effect, has not written into his script numerous miniature shots, left them to the end of his schedule and then found excuses for omitting half of them? And why? Because, unless the greatest care and attention to detail be lavished on their construction, and then on making them suitably dinted and dirty—and unless plenty of time be afforded for takes and retakes until at the *nth* attempt the desired effect is achieved — miniatures will look like miniatures, which of course spoils the film.

To be successful, miniatures must first be perfect in scale and detail; then they must be knocked about a bit and dirtied to simulate the real thing; and finally, they should be shot as soon as possible, but never in a hurry. Few cinema audiences realize how often they are looking at miniatures on the screen, because the professional film-maker has learned by hard experience to proceed as described above. Few miniatures are used so often in film production as boats and ships, and with them the river or sea on which they sail.

But although it is straightforward to construct a miniature model of a ship, it is a different story when that ship is floated in a tank of water supposed to represent its natural element. The model ship does anything but look like a real ship, while the water equally refuses to behave like the real thing!

The problem here is that of scale. In making a miniature we can reduce the scale of the ship, but there is nothing we can do to reduce the scale of the water. This deficiency is at once seen when we try to create "model" waves, or surf, or spray. Many dodges are used by professionals, such as adding to the water detergent, white paint, etc., to create the illusion of foam. But still our model ship will bob about, instead of riding its waves majestically, while those same waves tend to look too smooth and rounded to convey the illusion of an angry sea.

Science to the rescue

When, in 1947, I joined the Rank Organization to undertake photographic research, one of my first tasks was to prepare a paper on Water Effects, in which the theory of wave production was analyzed and practical details given for making and using ship models. This paper was later published (Oct., 1953) in "British Kinematography," where it may

MOVIE MINIATURES LOOK REALISTIC

Achieving realism in miniature marine models and sets is a matter of proper scale in the construction and a corresponding accuracy in the ratio of water wave motion.

By ROBERT L. HOULT, FRPS, FBKS

Formerly Technical Adviser, Pinewood Studios, London.

be seen by those interested in details. For the benefit of the reader I will quote freely a few extracts of particular practical value:

"Where two geometrically similar bodies similarly immersed are behaving to scale in the same manner, then they are said to be travelling at 'corresponding speeds'. If the speed of the model is c and that of the real ship is C, then:

$$\frac{C}{c} = \sqrt{\frac{L}{l}}$$

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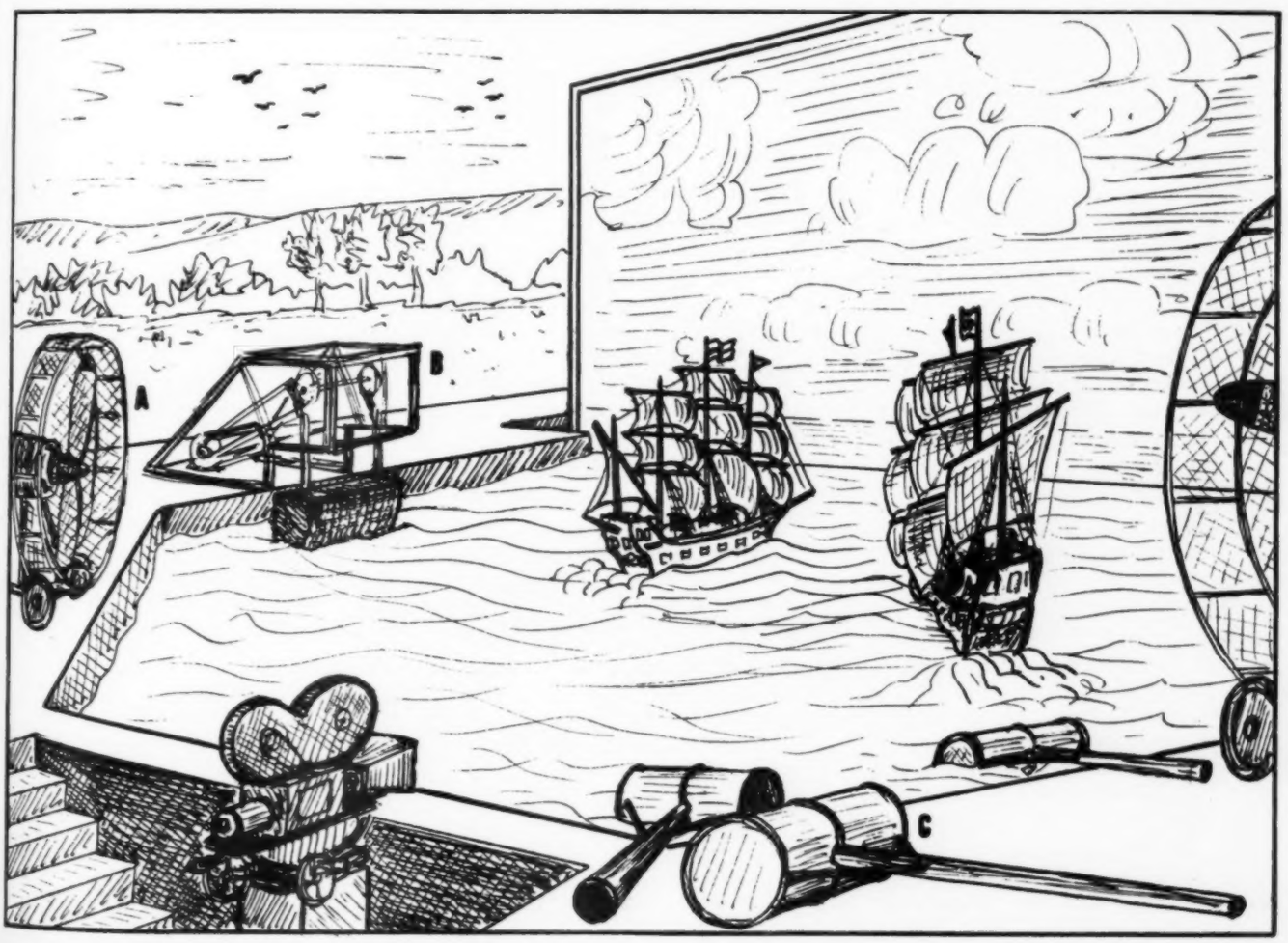

FIG. 2—POSITION OF EFFECTS equipment and miniature models in and around the Denham Studio tank for special effects scenes for "Hamlet," produced there in 1947-1948. In foreground is Mitchell camera on pan-tilt head, set low to provide proper viewpoint of model ships moving against cloud backdrop. Effects devices are: A-wind machine for churning up water surface; B-mechanical wave generator; and C-manually-operated wave makers. A second wind machine is at extreme right of tank.

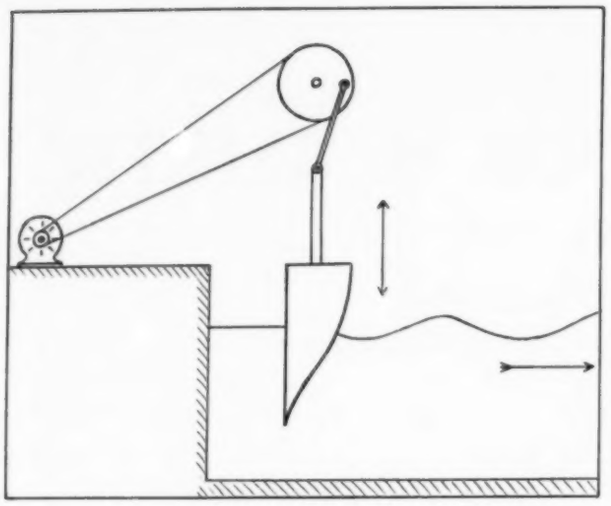

FIG. 3—Detail of electrically-driven wave generator shown at B in Fig. 2. As the wedge-shaped plunger rises and falls rhythmically in the water surface, waves are produced which travel away from the plunger.

where L and l are characteristic magnitudes (e.g. lengths). L/l is the scale of the model, and this can otherwise be expressed that *the factor for reducing the speed to suit the model is the square root of the scale.*

Thus, employing a scale of 1/12, a speed of 13 knots should be reduced to:

$$\frac{13}{\sqrt{12}} = \text{approx } 4 \text{ knots}$$

Of course the reduced speed is that required to provide a correct reproduction of wave-systems, pitching and rolling characteristics. The illusion will not be correct unless the apparent speed of the model can be reduced by a similar factor. This can be achieved by *increasing the camera speed, again by the square root of the scale.*"

"To insure that photographically-correct wave-forms are produced by a miniature ship in motion, it must be propelled at an actual speed in excess of 1.35 knots—whatever the scale."

"A miniature sea surface should consist of an underlying swell, produced by wave generators, on top of which are superposed systems of small waves, maintained by wind machines."

To obtain material for the above paper, research was conducted, not only among available publications, but also at the National Physical Laboratory, Teddington, where the subject was of great importance to the study of model hulls for ship design, and at the Royal Aircraft Establishment, Farnborough, where equal interest arose in the study of model fuselages for aircraft (to insure satisfactory "ditching" in the event of engine failure over the sea). Both establishments provided us with a wealth of information, while neither realized how useful their researches might prove to the film technician!

Filming a model ship sequence

My first experience of this particular problem came with the making of "Hamlet" (starring and directed by Sir Laurence Olivier) in 1947-8 at Denham Studios, London. At one point in the story, Hamlet embarks in a sailing ship, has a skirmish with some pirates and eventually returns to Denmark. Several scenes of these ships were produced with the aid of miniatures in the outdoor tank on Denham Studios lot (see Fig. 2). Like many others, this tank was provided with an artificial horizon; a low, level "dam" over which the water flowed continuously and behind which was situated a backing on which a continuation of the sea and the sky were painted.

This tank was provided with wave makers (B) and wind machines (A). The former were of two types: one, an electrically-operated mechanism (Fig. 3) which oscillated vertically a specifically shaped plunger immersed in the water at one side of the tank; the other, a number of oil drums (shown at C in Fig. 2) fitted to the ends of poles, which stage-hands pushed up and down in the water in the same way as the mechanical wave-maker, but of course producing waves of smaller amplitude. The wind machines were of the conventional type in which an airscrew was driven by an electric motor and directed across the water surface.

These arrangements were quite effective. The wave generator was used to produce a steady pattern of large waves covering the whole water surface. The hand-operated wave-makers produced, from a different direction, a series of trains of small waves, criss-crossing the train of large waves—while the wind machines produced patches of very small waves, as would gusts of wind on a real sea. The latter also served to fill the sails of the model ships and set their flags a-flying (Non-sea-faring technicians please note: on sailings ships the flags fly forward, with the wind: unlike the flags of power-driven ships, which usually fly backwards). The total effect was a realistic seascape, with waves of all sizes crossing and recrossing and maintained for as long as the director wanted them. At the same time, white paint was exuded from the sterns of both ships, producing realistic wakes.

The ships were pulled through the water by submerged cables, at speeds calculated by reducing the speed of a

Continued on Page 616

FIG. 4—Remarkable for its authentic detail was this miniature set erected in tank of Elstree Studio, London, for the production "Gorgo." Utmost realism was achieved through precise scaling of both the miniature construction and the motion of the water. Scene is a dock on the river Thames.

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Speed and precision, borne of long experience, are keys to the consistent top quality of the photography of "Hawaiian Eye." Here are some sideline observations of cameraman Ed DuPar and his crew shooting scenes for the show in Hawaii and on the sound stage.

Filming "HAWAIIAN EYE"

By ARTHUR E. GAVIN

READY FOR ACTION—Director of Photography Ed DuPar, ASC, (center), operator Bob Tobey, ASC, (right) and assistant Bill Rinaldi prepare to shoot a scene for "Hawaiian Eye" on location in Honolulu.

BOB CONRAD (top photo), who plays Tom Lopaka, is photographed leaving an Aloha Airlines plane at Lihue Airport for scene for "Hawaiian Eye." Scenes tying in with such exits are filmed later on the sound stage in Hollywood. (Aloha Airlines photo by Walt Pollock).

GROUP OF "EXTRAS" (photo at left) board a catamaran at Hawaiian Village hotel pier at Waikiki for scene for "Hawaiian Eye" being photographed by operative cameraman Bob Tobey behind camera. (Hawaiian Village photo by G. Fitzgerald).

WHILE NATIVE Hawaiians rehearse torch-lighting ritual on grounds of the Coco Palms Hotel at Kauai, Ed Dupar aids in lining up camera for the scene. Technician, crouching low on footbridge, holds Garnelite directing fill light on conch shell blower (center). (Aloha Airlines photo by Walt Pollock).

ABOARD THE CATAMARAN—Cast and extras loll on deck while Ed Dupar (seated on boom, top center) and Bob Tobey (at his left) size up camera situation for upcoming shot. Poncie Ponce, who plays Kim, may be seen at top left, while Bob Conrad appears seated in foreground and looking to left. Despite the holiday aspect of things, its all hard work for the camera crew —lots of fun for the visitor-"extras." (Hawaiian Village photo by G. Fitzgerald.)

THE ACHIEVEMENT of good photographic quality in TV films is not particularly difficult when the Producer appreciates quality and the Director of Photography is a veteran photographer of feature films. There is no substitute for experience, and a man who has photographed movies continuously for forty years at the same studio likely never has to apologize for his work.

If you are a consistent follower of the "Hawaiian Eye" television series, you have probably observed the name of Edwin DuPar, ASC, in the credits as Director of Photography. DuPar, who started working for the Warner brothers in 1920 and shot the first "talkie" made in Hollywood, has been photographing the series for the past two years. Technically, "Hawaiian Eye" is considered one of the best photographed TV film series. This fact is all the more interesting when one considers the speed with which each show is filmed.

We had occasion to watch DuPar and his crew

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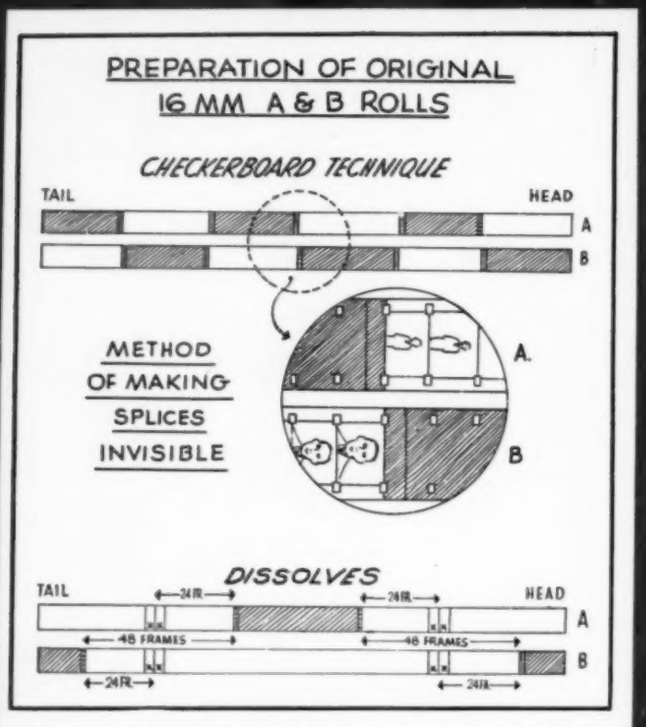

FIG. 1—The "checkerboard" technique for making "invisible" splices which alternates scenes back and forth on the A & B rolls. The symbols for preparing A & B rolls for dissolves are shown in diagram below.

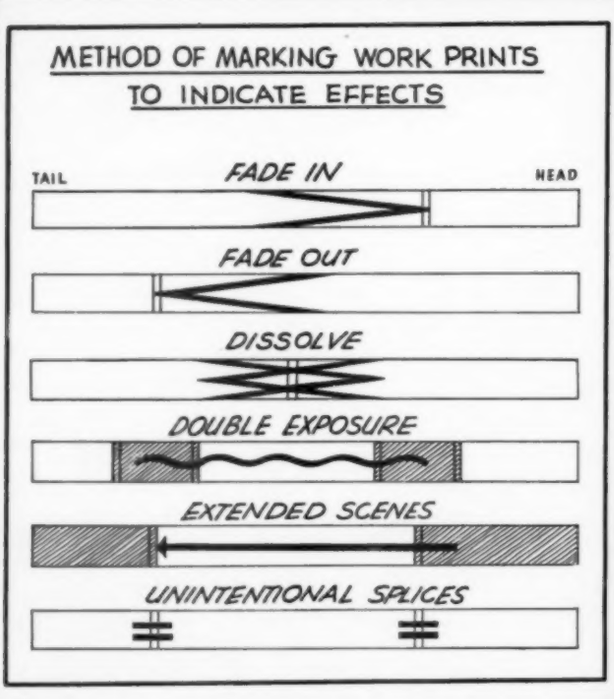

FIG. 2—In the preparation of 16mm A & B rolls, the above symbols are recommended for marking prints for the most common optical effects.

How T

By ALVIN D. ROE

"A & B ROLLS" is a motion picture trade procedure of assembling, in two or more rolls instead of a single roll, original scenes so edited, arranged and marked that any desired optical effects, such as fades, dissolves or superimposures, will be printed in to each release print or duplicate negative.

In 35mm productions, the special effects editor uses a similar method of preparing scenes for such effects. Here the common practice is to select two scenes between which a special effect is desired, prepare these A & B, and by use of an optical step printer, make a new negative with the desired effects printed in.

Because most 16mm release prints, particularly those in color, are usually made directly from the camera original on a continuous contact printer, dissolves and other effects to be printed in must be prepared in advance by the A & B roll method. This direct printing procedure for 16mm, involving as it does only one transfer step or "generation," results in release prints having better characteristics than prints made from an intermediate "master." Moreover, the A & B method has the advantage of incorporating optical effects in the film during the printing step, making it unnecessary to cut in dupe sections containing the effects.

Effects Indicated By Symbols

In the A & B editing procedure, the first step is to edit and assemble the work print, marking with a grease pencil the locations where the various effects are desired. These effects are indicated by symbols. Recently the Association of Cinema Laboratories, Inc., established as standard a set of symbols for use in A & B roll editing, which provides a common language or means of communication between the editor and the film laboratory. These symbols are shown in Fig. 2.

In matching the original scenes to the edited work print, a multi-channel or "gang" synchronizer is used by the editor, such as the one pictured in Fig. 3. In A & B roll editing, three channels in the synchronizer are used. The work print head bearing a sync mark is inserted and locked in the top channel of the synchronizer, as shown in the illustration. Then the "A" and "B" roll leaders with corresponding sync marks are locked in place in the next two channels so that the sync marks of both films are in alignment with the sync mark on the work print.

Edit 16mm A & B Rolls

The procedure for preparing 16mm film for the addition of fades, dissolves, and other optical effects.

The three films are now lined up in perfect sync, and remain so to the completion of the A & B editing procedure.

From this point, the A & B roll procedure is as follows: the first original scene or title is attached to the leader on the "A" roll so that its action—and edge numbers, if there are any—exactly match the corresponding work print scene when passing through the synchronizer.

Three Takeup Reels Indicated

There are three takeup reels employed in the procedure—one for the work print, one for the "A" roll, and the third for the "B" roll. Footage for the work print takeup comes from the supply reel at the left of the workbench, and for the "A" and "B" takeups by film or leader added or cut-in in the editing procedure. At first, white leader only is rolled up on the "B" roll takeup. All three films are rolled through the synchronizer, and scenes are matched and attached in proper order to the "A" roll until a crayon symbol appears on the work print indicating an effect is to be inserted.

In the case of a dissolve, and the two scenes in the work print to be dissolved are already spliced together, it is unnecessary to cut out the outgoing original scene. Instead, it should be extended 24 frames beyond the work print splice. The incoming original scene is then matched to the work print, but instead of cutting it off opposite the work print splice, it, too, is extended 24 frames to precede the splice, with the leaders cut off accordingly.

It is important at this point to *cut out of the work print* the necessary 48 frames for each dissolve, thus insuring that the original is long enough to extend the required 24 frames each way from the work print splice. This dissolve switchover from "A" roll to "B" roll results in a 48-frame overlap of the two scenes opposite the work print symbol for the effect.

Purpose Of White Leader

From this point, the editor proceeds to match and attach (splice) successive scenes to the "B" roll. The use of white leader is now switched to the "A" roll. This leader material, it should be explained,

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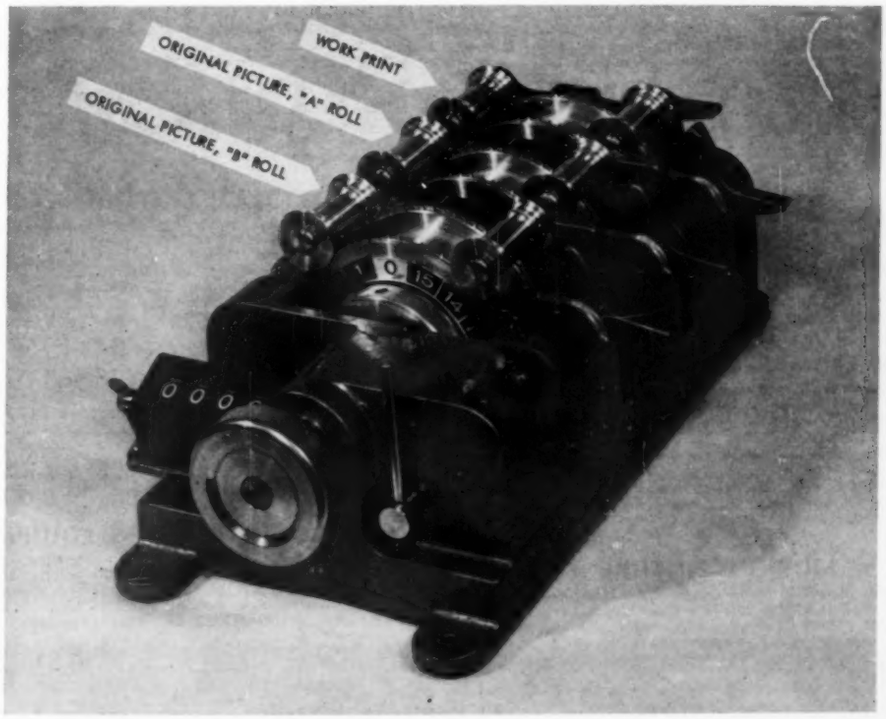

FIG. 3—Three gang synchronizer commonly used in editing A & B rolls. The three films are locked in the synchronizer in the positions indicated—the procedure being the same for either 16mm or 35mm film. With the work print head sync-mark established in one channel of the synchronizer, the leaders of rolls "A" and "B" with corresponding sync marks are locked in place directly opposite in the two adjoining channels. In this way exact synchronism is maintained between the three films throughout the editing procedure.

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FIG. 1—BIRDS OR BLASTOFFS—either subject can be filmed successfully and with safety when camera is remote-operated by means of short-wave radio impulse.

FIG. 2—PUSHING BUTTON on remote control transmitter creates radio impulse, which is picked up by receiver connected to camera control unit. Transmission range is one mile.

How difficult shots are made with the aid of tiny radio transmitters.

SHORT-CUTS WITH SHORT-WAVE

INDUSTRIAL AND RESEARCH cinematographers often are faced with the problem of operating a 16mm camera by remote control from a safe distance when called upon to photograph a non-repetitive event involving an element of personal danger—such as an unusual high-angle shot from an overhead crane hook, from the front bumper of a fast moving automobile, or the belly of an aircraft. A similar problem is involved sometimes when a missile blast-off is to be recorded from atop the umbilical mast on the launching pad, and, in a less dangerous way, when wildlife is to be recorded in natural habitat.

Many of these shots, of course, generally can be made by using a lightweight electric motor driven camera controlled remotely from a distance by cable. There are some objections to this method, however: the need for stringing cable, possibility of electrical connections parting during a shot, and power failure. Also, where such remote-controlled shots are made with the camera set at a great height, the control cable may be unhandy, hazardous, or impossible to string.

A successful alternative and one finding increasing use, is the utilization of a small short-wave radio transmitter to provide a practicable and dependable means of remote, wireless control of the camera. Such transmitters are widely used to control model aircraft in flight, open and close garage doors, etc.

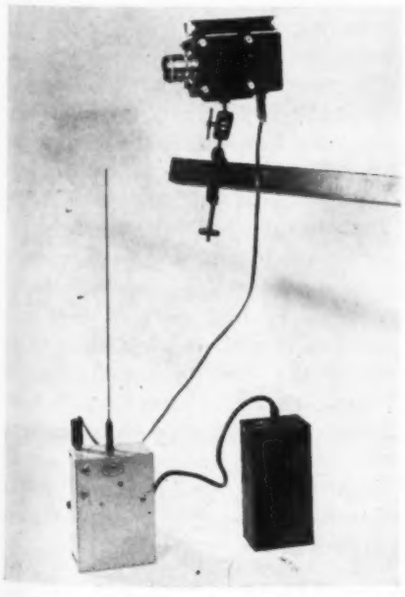
A typical short-wave radio set-up of this kind is shown in the accompanying illustrations. It consists of receiving unit and antenna, battery power supply, and cable leading to solenoid mounted on the camera (Fig. 3), and the remote-control transmitter, shown in Fig. 2.

The main control unit, which is essentially a small, compact radio transmitter on the order of the wartime "Walky-Talky," is relatively inexpensive and has but a single control switch. The receiving unit, which is used to stop and start the camera, consists of one or two small tubes and a relay in a tiny housing. Weighing but a few ounces, it can be mounted on the camera battery pack or on the camera itself. This miniature receiver can be operated if necessary from a line-of-sight distance of one mile. Pressing a button on the transmitter operates the receiver relay which controls the camera starting switch.

In specialized filming operations, where more than one camera may be required to record an operation from various distances or angles, the one transmitter can be used to control all

Continued on Page 624

FIG. 3—16mm GSAP (gun) camera set up for remote operation by short-wave radio. Receiver with antenna is shown at lower left; battery power supply for camera motor is at right.



Filter Lore

By CHARLES LORING

DESPITE THE INCREASING use of color film, there is and always will be important uses for black-and-white film. And this being so, knowledge and use of filters are important to cinematographers everywhere.

While a great deal has been published on the subject of filters for photography, it is not possible for anyone but the most experienced photographers to know what results various filters will give and the factors of such filters. What follows, therefore, is a capsulized description of the most important filters used today in cinematography; it is intended as a handy reference for readers who may need such information in their work.

It is a fundamental law of physics that a filter *transmits* or passes light of its own color, and *absorbs* or holds back light of a complementary color. Thus, a yellow filter will pass yellow light but hold back blue light, which is complementary to it. Because all filters reduce (in varying degrees) the amount of light passing through the lens to the film, it is necessary to increase exposure to compensate for the addition of a filter. The number of times this exposure must be increased is known as the *filter factor*.

To illustrate the principle of the filter factor, let us suppose that the normal exposure for a particular scene is f/5.6, without the filter. We decide to use a yellow filter with a factor of 2. This means that the lens must be opened up one full stop, admitting twice as much light, in order to compensate for the amount of light held back by the filter. Instead of f/5.6, the aperture will now be f/4.

Basically, filters fall into three categories: (1) Those that are used to correct the rendition of certain colors in a scene so that they will record in the proper tonal values as they appear to the eye; (2) those that purposely distort or exaggerate the tonal values of a scene for special effect; and (3) those used to reduce the amount of light reaching the film.

First, we shall consider the filters used for corrective purposes. In black-and-white cinematography, blue water and blue skies tend to "burn up" because of the excess of ultra-violet light which they reflect. In order to tone such areas down to the point where they will be recorded on the gray scale in tones faithful to their value in the actual scene, it is necessary to use filters that will absorb or hold back the blue portion of the spectrum. The following are some of the filters most widely used for this purpose:

Aero 1 or K1—Light yellow in color, these filters transmit most of the visible spectrum. They absorb only the shorter wave lengths of the ultra-violet area, producing a very small degree of sky and water correction.

Continued on Next Page

Aero 2 or K2 — Yellow filters, slightly deeper in tone than those described above. They absorb enough ultra-violet and blue-violet to produce a noticeable darkening of the sky; clouds stand out in contrast. They slightly increase the contrast of distant landscapes, but produce (in gray tones) the closest approximation of correct color rendering as seen by the eye. They do not alter the quality of ordinary panchromatic make-up.

G Filter—A deep yellow filter which absorbs blue and violet completely, plus a portion of the blue-green. A very popular filter, it is especially valuable in shooting landscape scenes where there is considerable sky in the composition. It renders sky and water in rich gray tones, causing clouds and foreground objects to stand out in clear relief. It eliminates ultra-violet rays which would record as overall haze on the film, especially in distant landscape scenes.

Wratten 21: Orange—Used with panchromatic film, it produces a slight over-correction of blue and violet tones, bring out clouds in sharper contrast than does the G Filter. It is useful in penetrating haze, especially with longer focal length lenses and causes panchromatic make-up to be lightened in some degree.

Filters For Over-correction

The four filters described thus far are, generally speaking, considered to be normally corrective and are used to produce a more faithful rendition of the scene in terms of black-and-white tones. The following filters, on the other hand, produce a marked over-correction of true tonal values and, therefore, fall into the category of *effect filters:*

Wratten 23A: Light Red—This filter absorbs all of the blue-violet and most of the green portions of the spectrum up to a wave length of 5,600. It produces a dark sky effect and rich cloud contrast without appreciably lightening foreground subjects. Normal panchromatic make-up is lightened slightly.

Wratten 25A: Red—Produces an even more dramatic effect than the 23A; special make-up is necessary if faces show in scene. This filter is often used with infra-red film to hold back blue and green light.

Wratten 29F: Dark Red—Produces extreme contrast and over-correction. It is used with panchromatic or infra-red emulsions to create night effects in sunlight. Special make-up is necessary if faces show in the scene.

Wratten 72: Deep Red—Absorbs all light up to a wave-length of 5,900. It is used almost exclusively for producing night effects in sunlight with panchromatic film. It creates a more natural effect than the 29F, especially in closeups, and no special make-up is required.

Filter For "Moonlight Effects"

For softer night or "moonlight" effects, a 23A (Light Red) and a 56B (Light Green) filter can be combined with pleasing results. For fantasy effects or "dream" sequences, infra-red film is used in combination with 25A, 29F, 70, 72 or 88A filters. In such filming, blue skies are rendered very dark, with foliage almost white, producing a very unreal pictorial quality. Careful application of special make-up is necessary.

Green filters are not widely used in motion picture photography, but they have special characteristics that sometimes prove valuable. Because they transmit green light completely, they are especially useful in photographing trees and woodland scenes. The greens of the foliage print brighter and with sharper detail, while blue skies go slightly darker. Green filters are valuable in shooting sunset scenes because they produce contrast between reds and yellows, holding back whatever portions of blue light are present.

Under *effect filters*, we properly list diffusion and fog filters. These are made by various manufacturers and are usually available in 2½" round as well as 2" and 3" square types that fit into standard matte boxes. They are available in a range of correction values, and produce an overall diffusion or softening of detail for pictorial or dramatic effects.

Diffusion filters are effective in enhancing the pictorial values in landscapes and seascapes. In Hollywood studios they are also used in shooting closeups since they tend to soften facial lines and minimize unattractive features.

It should be remembered that the motion picture cameraman cannot resort to dodging, retouching or diffusion in enlarging, as does the still photographer. Thus he must do all "correcting" at the time the scene is shot by means of lighting, proper make-up and the use of diffusion filters.

Fog filters are employed to produce an ethereal haze or mist over a scene. When smoke is blown onto the set at the same time, a realistic effect of swirling fog is created. Fog filters lend atmosphere to rain shots, dawn shots, waterfront scenes, etc. They also serve to intensify the dramatic mood of sequences played in graveyards, battlegrounds and other outdoor locales where an eerie quality is essential. Fog filters are available in a variety of densities ranging from a very light misty effect to a dense, ghostly effect.

Functions of ND Filters

Neutral density filters reduce the amount of light passing through the lens but *without* affecting the color balance or contrast of the scene. Gray in color and available in a wide range of densities, they are often used in combination with color filters, diffusion filters, etc.

An important use for neutral density filters is to permit the cameraman to work at a larger lens aperture thus throwing the background into softer focus, to concentrate attention on foreground action. They are also valuable in cases where the cameraman has only a fast emulsion available and the light is so intense that he is not otherwise able to stop down the lens far enough to get the desired exposure.

Graduated filters are used when it is necessary to correct or hold back one area of a scene while allowing the rest of the scene to come through as it naturally would record. Such filters are especially effective when a cameraman wishes to reduce the density of sky or water areas in a scene without disturbing the normal balance of other portions of the composition.

Continued on Page 618

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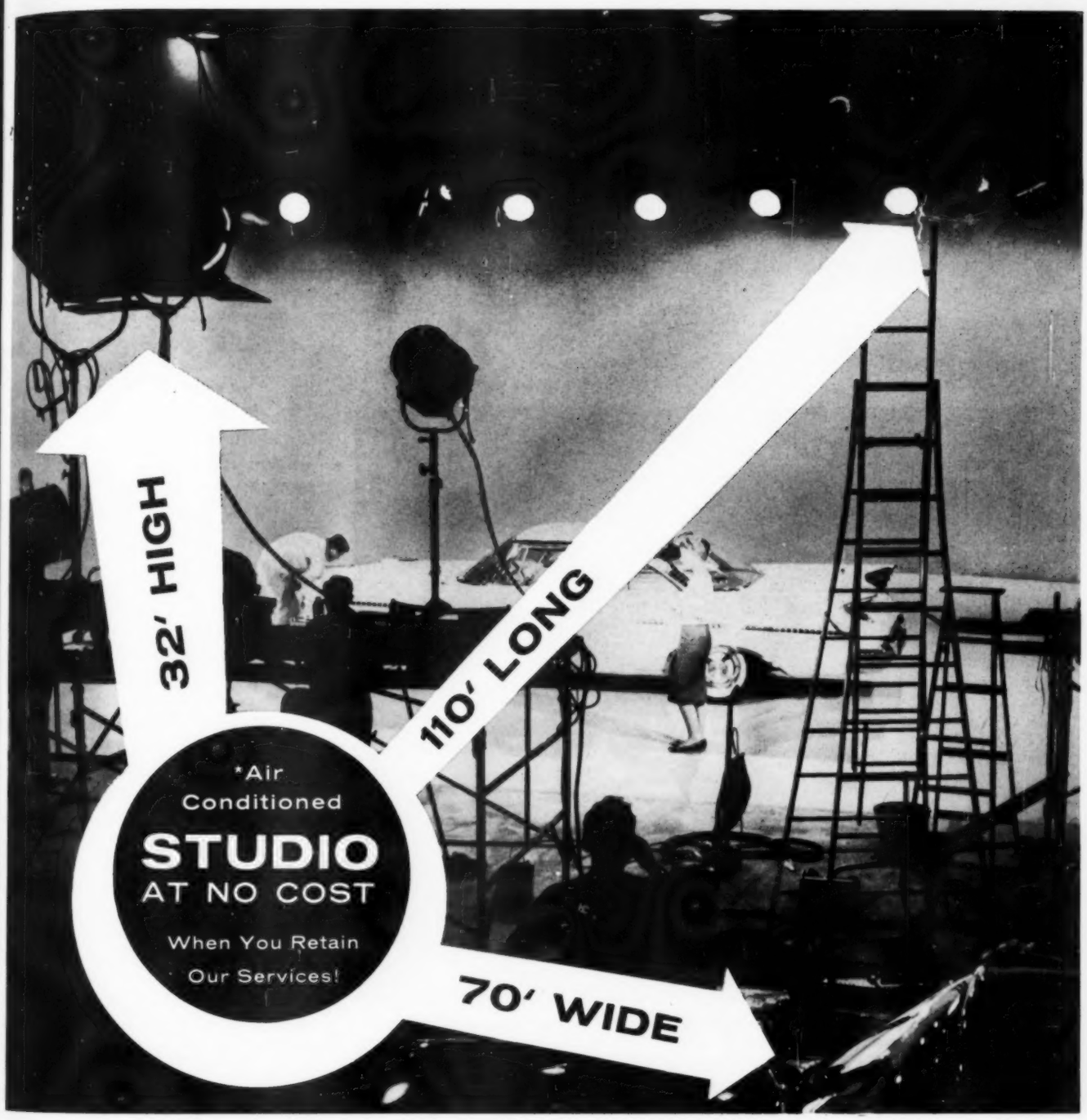

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Controlling Perspective

How lenses of different focal length, correctly used, can enhance pictorial composition, lend a different aspect to interiors, and give dramatic impact to otherwise commonplace scenes or action.

By JAY DONOHUE

A CLOSEUP of two gears on a moving turntable is given pictorial emphasis through heightened perspective achieved through use of wide-angle lens on Cine-Special 16mm camera. Photographer is shown taking an incident light reading before setting camera in motion for the shot.

WHETHER YOU ARE photographing a set of gears, a mechanical operation, or scene on a Hollywood sound stage, perspective is an important consideration in choosing the lens to use and the position of the camera.

True perspective in a photographed scene is a rendition in which all objects appear as they do to the eye viewing the actual scene. However, for one reason or another, there are times when a more dramatic effect in composition is desired, and this is obtainable by use of a certain lens in combination with appropriate camera-to-subject distance.

How to control perspective is one of the more important technical assets of the professional motion picture cameraman. On the Hollywood sound stages, cinematographers aren't satisfied simply with adjusting subject tones with lighting and injecting "plane composition" in the framing. They know that perspective, too, can be completely under their control and they choose camera angles and lenses accordingly.

To the eye, the illusion of perspective depends upon the obvious convergence of parallel lines, the comparative scale of familiar objects, the required adjustments of the eye, the effects of binocular vision, and various subjective impressions. In photography, the lens-to-subject distance, independent of focal length or aperture, controls the basic perspective effect.[1]

We may think of perspective not only as the convergence of parallel lines, but also as a progressive diminution of the apparent size of things with increasing distance. Perspective must not be confused with "depth," as depth is a combined effect of both literal and psychological elements. Irrespective of the focal length of the lens or the size of the negative, perspective is controlled only by the distance between lens and subject.[2]

Stronger Perspective

From a given camera position the lens of short focal length will take in more of the setting while a longer focal length lens takes in less. And the amount included in the scene is inversely proportional to the focal length of the lens. But if you should move back with the longer lens to include the same view obtained with a short one, the final effect will *not* be the same. Scenes made with the wide-angle lens will have a stronger perspective. In other words, foreground objects will be enlarged and distant objects made much smaller.

The wide-angle is a lens of many uses, but its chief advantage is probably the ability to dramatize picture set-ups. Perspective is increased, objects and persons rounded out, and movement towards and away from the lens is sharply accentuated. Melodramas filmed with short focal length lenses give scenes extra "punch." The 24mm and 28mm lenses are the extreme ones; their equivalent in

16mm photography would be 12mm and 14mm. Viewing low angle scenes made with these lenses, the camera seems to be a foot below the floor level. Walls seem to curve outwards, and shadows become menacing.

The 35mm lens, once considered strictly a wide-angle lens for 35mm cinematography, is now used as standard in several studios. It lends better modeling to the actors if they're not in too close and retains good perspective that lends an illusion of three dimension on a flat screen. Some faces, however, are definitely not flattered by this lens, and it should not be used for big closeups except where slight distortion is desired. A closeup made with this lens has the distortion of a long-shot made with a 28mm or 32mm lens.

Compositional Impact

The equivalent lens for 16mm cameras is the 17mm, one that can well be used as standard. While few 16mm cameras can produce the crisp, sharp photography of the 35s, the 16mm cameraman is not bound by the limitations on perspective that prevail with 35mm. Thus use of the 17mm lens can give his compositions a forceful impact, pictorially. Photographers of industrial subjects will find this lens especially useful as a means of dramatizing compositionally, a client's factory, display room, etc. Assembly lines photographed with this lens appear 30% longer, and buildings appear generally more spacious.

The imaginative 16mm cameraman, alert to use of foreground props to enhance composition and enliven dull scenes, will find the 17mm lens of immense help in this respect. Being shorter than the one-inch lens, it has

Continued on Page 624

LENS EQUIVALENTS

Film Size: 35mm	16mm
24mm	12mm
28mm	14mm
30mm	15mm
35mm	17½mm
40mm	20mm
2 in.	1 in.
75mm	37½mm*
4 in.	2 in.
6 in.	3 in.

*A re-mounted gun-camera lens of 35mm focal length can be used in place of the non-existant 37½mm lens.

LOOKING OVER three-dimensional area of the Atlanta Cyclorama for likely camera set-up for scene for "Captured Moment," is Peachtree Productions' writer-producer Philip Taylor.

AURICON Pro-600 camera is set low for upcoming shot on river location where actors receive attention from Director Skip Thomas (midstream) and Make-up Man John Kollock (back to camera).

Giant cyclorama provides ready-made sets for

"Captured Moment"

By PHILIP W. TAYLOR

THE FAMED ATLANTA CYCLORAMA, one of the largest three-dimensional paintings in the world, was the setting for a climactic battle sequence in "Captured Moment," a public relations film recently produced for the Atlanta Transit System by Peachtree Production Associates, Inc., Atlanta, Georgia.

The Cyclorama, a major tourist attraction for many years, is a reconstructed scene of The Battle of Atlanta, which took place on July 22, 1864, during the Civil War—hence the title of the film "Captured Moment."

This 24-minute 16mm color film concerns events in the lives of three Confederate soldiers just prior to the battle. Through the "naked eye" technique augmented with appropriate battle sounds, the film reaches its climax in a four-minute sequence photographed entirely within the Cyclorama.

Because of the prevailing low light levels and the forced perspectives of the painting, an unusual challenge was presented in the photography. For all the interior shots made here, 16mm Ektachrome, Type ER film was used exclusively. Despite the high speed of this film, it was necessary to work at an exposure of f/2.8. Fortunately, this presented no depth of field problem because most of the foreground figures and the terrain of the Cyclorama are three-dimensional, which was accentuated by giving the individual figures special lighting.

For the live-action scenes, the company chose a location about twenty miles north of the city that simulated Atlanta's famed Peachtree Creek, Au-

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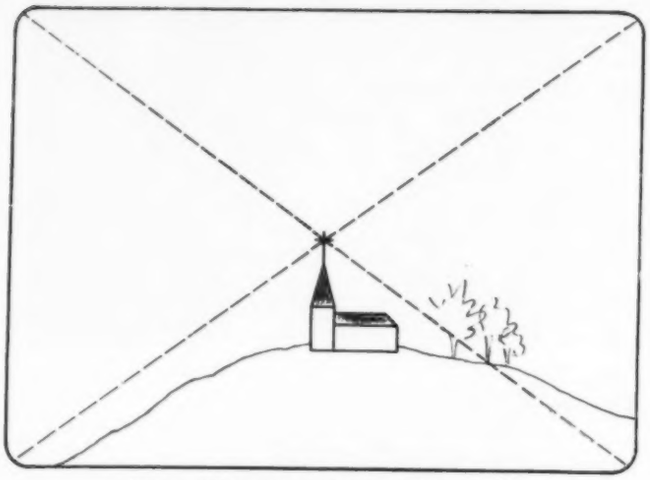


FIG. 1—Wide-angle position, focal length 17mm.

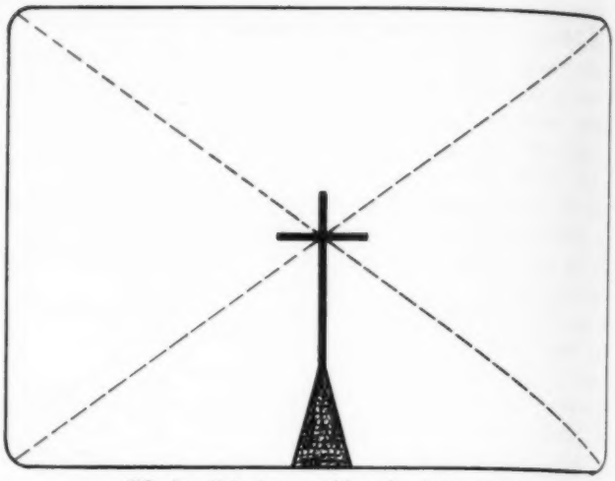


FIG. 1a—Telephoto position, focal length 85mm.

FIG. 2—Wide-angle position, focal length 17mm.

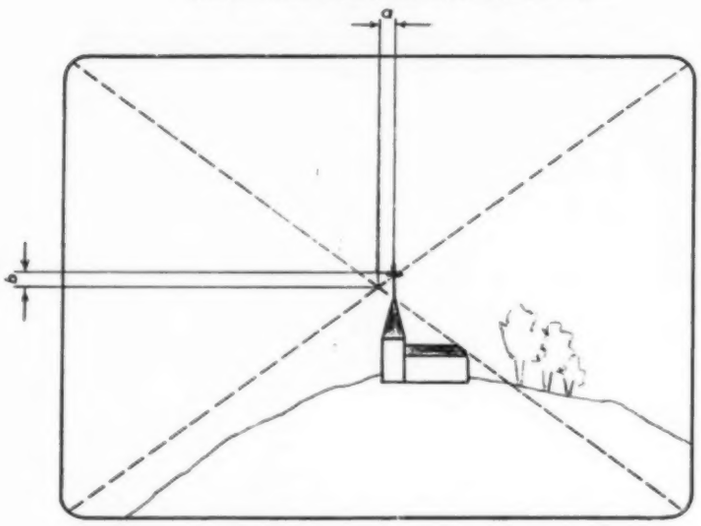
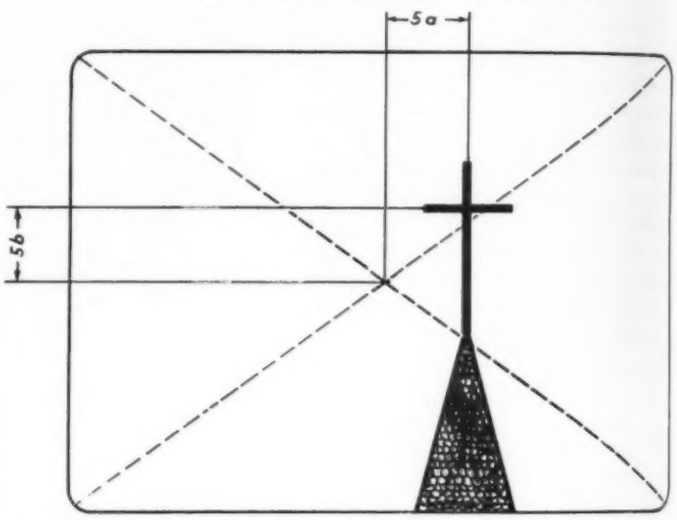


FIG. 2a—Telephoto position, focal length 85mm.



UNWANTED DISPLACEMENT of central subject in scene occurs in a zoom shot (Figs. 2 and 2a above) when scene is composed with zoom lens in wide angle position. Desirable result is shown in Fig. 1a.

TECHNIQUE FOR ZOOMING

How to avoid off-center displacement of subject in zoom shots.

By E. KAESTNER

OPTIMUM RESULTS from any product or device can result only when the user fully understands its function, operation, and its limitations, if any. With the increasing use of zoom lenses on all types of motion picture cameras has come increasing queries about their operation and some of the results obtained with them.

One of the major problems has to do with the displacement from the center of the frame of the main subject in a scene, particularly when zooming from wide-angle to telephoto position.

The illustrations above explain graphically the cause of this result and suggest what the motion picture photographer can do to avoid it.

Figure 1 shows the subject—a cross on top of a church spire—correctly framed, with the spire exactly centered in the frame. When the lens is zoomed to telephoto position, the cross and church spire remain in the center of the

Continued on Page 630

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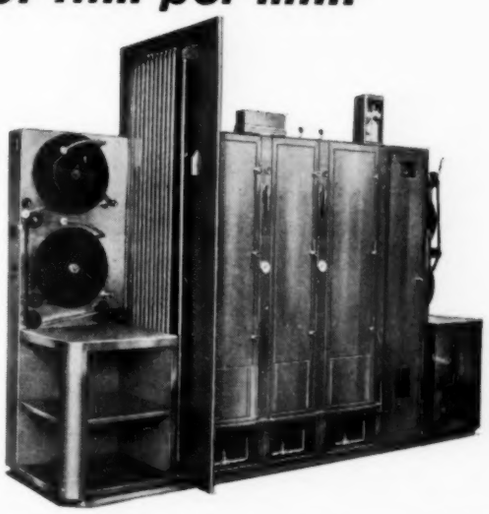

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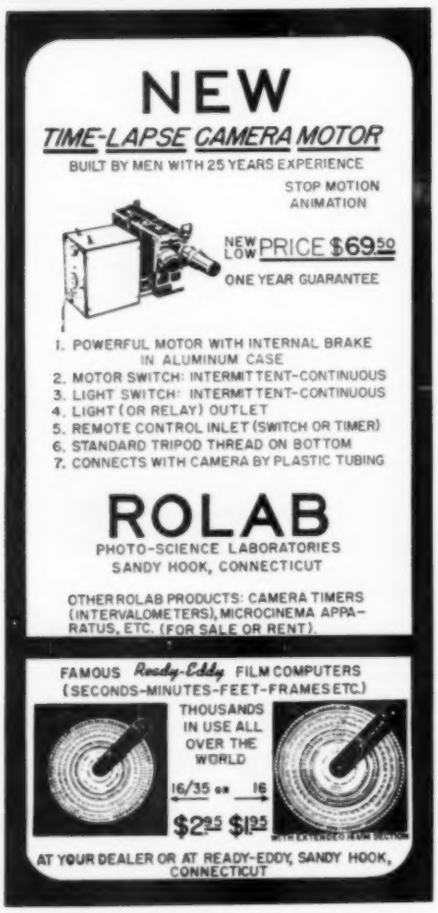
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MAKING MOVIE MINIATURES THAT LOOK REALISTIC

Continued From Page 600

full-size ship by the square root of the scale of the miniature model, while the camera speed was simultaneously increased from normal by a similar factor.

This same technique continues in use. It is capable of excellent results, as readers of American Cinematographer will have seen in the April, 1960, issue, where the very successful miniature scenes for "The Wreck of the Mary Deare" were described. The purpose of this article is to add to what is already known, a few basic rules useful to the cameraman who has to reproduce in correct scale the motion of miniature boats and ships.

An alternative technique

For many years the water tank has been a normal studio facility. Situated outdoors on the lot, or indoors on a stage—permanent or temporary, large or small—every technician remembers the tank used on such-and-such a film, the time it took to prepare, the difficulties experienced, and the exasperation of the producer as costs exceeded budget. For however skilfully the technician handles his models or generates the waves, the result is never quite predictable, and there are invariably a few retakes necessary to secure perfect matching with location scenes.

In paragraphs 2 and 3 were given basic rules to guide the cameraman in securing correct filmic motion of the model boat or ship. At the same time, it was recognized that the water itself could not be scaled down in the same way as the model. That is to say, on the screen, the appearance of the model would be correct, while that of the water would be only approximately so; and especially would this be noticeable in the formation of surf or spray, where the water drops would always appear too large to be in scale with the model.

To overcome this additional problem, an entirely different technique can be used, in which the miniature model is not immersed in the water at all. Instead, model and water are photographed separately — the model to scale and the water in its natural state —and the two separate scenes subsequently combined together by travelling matte technique. (See American Cinematographer for Oct./Dec., 1959.)

Except for the occasional long shot in which a model ship or the like is to be seen in its entirety, the majority of water effects can now be secured by photographing sea or river at full scale and combining it in the laboratory with a foreground scene, which may be either a model or a full-scale set. Thus, for the film "Passage Home" (Pinewood Studios, 1955), full-scale reproductions of the bow and stern halves of a 10,000-ton cargo vessel were built on one of the large stages, and each surrounded by the necessary blue backing. The foreground lighting was filtered yellow, and shooting proceeded, using a beam-splitting camera (as described in American Cinematographer for Oct., 1959). The two halves of the vessel were each mounted on a hydraulically-operated pivot to simulate roll, while camera movement simulated pitch. Full details of each camera set-up were carefully recorded, and this data used to select a matching scene of seascape (shot by the location unit) for subsequent use as background to the shot. Especially pertinent in this procedure are—

i focal length of camera lens,
ii angle of tilt of camera,
iii height of camera above sea level

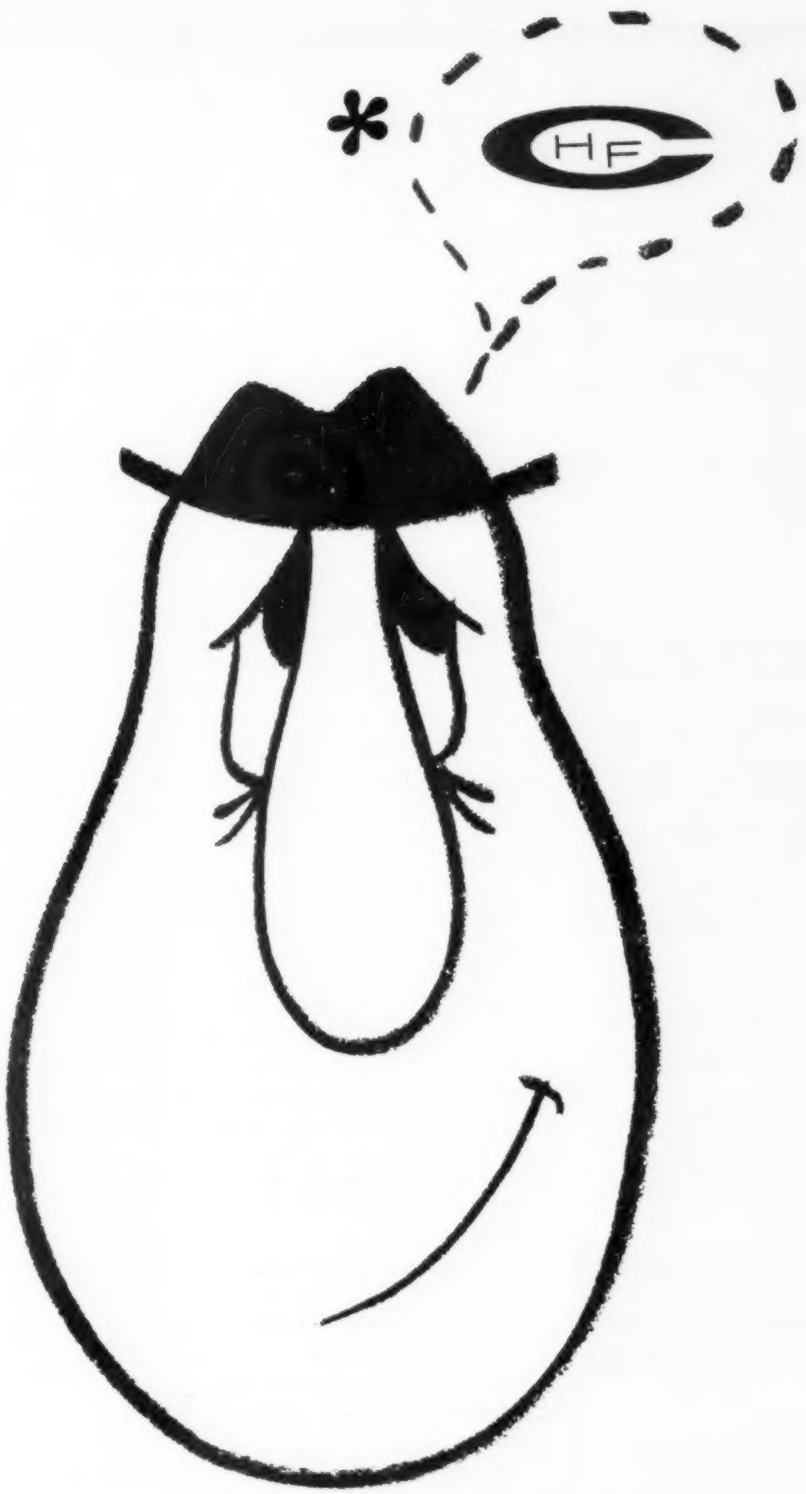
—three geometric quantities which are the minimum needed to insure perspective matching between the foreground and background scenes.

Normal stage effects on the foreground were also provided by means of wind machines, rain sprinklers, and elevated water tanks with chutes to deluge the vessels in simulation of a heavy sea. The production value of the final composite scenes was, however, superior to anything which could have been obtained by the use of painted scenery, back projection, or model ships.

Travelling matte seascapes

The first major production to use this technique on a large scale was "The Gift Horse" (Shepperton Studios, 1952), a story of the transfer during the war of an American destroyer to the Royal Navy. Here, too, a full-scale reproduction of part of the destroyer was built on the huge silent stage at Shepperton. The same blue and yellow lighting was used and an equally impressive result was obtained. This film helped to launch the travelling matte

Continued on Page 618



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process on the sea of feature film production, where its ability to reproduce faithfully all normal atmospheric effects (spray, rain, smoke, etc.) has proved its value wherever film makers "go down to the sea in ships."

On a smaller scale, "The Sea Shall Not Have Them" (Riverside Studios, 1954)—a story of the Royal Air Force Air-Sea Rescue service, featuring the late Bonar Colleano, was completed without any one of the four principal actors having to put to sea at all, an important economy in commercial film production. Instead, they had but to play their parts in the rubber dinghy mounted on pitch-and-roll rocking gear in a small stage at Riverside, London. Subsequently, in the laboratories at Denham, they were enabled to sail cinematically through over 3,000 feet of travelling matte sea.

A more recent example is "A Night to Remember" (Pinewood, 1957), in which the ill-fated "Titanic" sailed on her last voyage through a celluloid ocean. Like the "Mary Deare," the climax of this film lies in the foundering of a fine ship, for which the same technique of miniature ship and studio tank was used to good effect. These miniature scenes were intercut with many full-scale foreground sets shot by travelling matte and superposed on full-scale matching seascapes.

All the productions described above were filmed in black-and-white. However, the travelling matte technique is also "plain sailing," as demonstrated by the film of that title produced in 1956 at Pinewood, in which the sodium light method of producing mattes was used in England on a large scale for the first time.

Thus we see that the film producer, undertaking a sea story, has a variety of techniques at his disposal that enable him to achieve utmost realism where the economies of production or the physical obstacles of locale or location make the use of effects mandatory. No one technique is the final answer. Each has a specific use—a special adaptability—which the experienced technician will select to fit the situation at hand. ■

FILTER LORE FOR CINEMATOGRAPHERS

Continued From Page 610

Graduated filters, available generally in 2″ and 3″ squares, are obtainable in a great variety of densities and combinations. Some of the more popular types include: Aero 1-to-clear, Aero 2-to-clear, 15G-to-clear, 25 Neutral Density-to-clear, 50 Neutral Density-to-clear, and 100 Neutral Density-to-clear.

Graduated filters must be lined up by viewing directly through the lens, so that the corrected area of the filter just touches the horizon or landscape line. Both camera and filter are then locked securely in place, so that the foreground will be photographed through the clear portion of the filter while "hot" sky or water areas are held back by the denser portion of the filter.

Clear *haze filters* of special quartz glass screen out stray ultra-violet light and are used most effectively in color filming to cut down haze in distant landscapes, especially when lenses of long focal length are used. Such filters have no filter factor, which means that no increase in exposure is necessary when they are used.

The *Pola Screen* is a special type of filter useful both in black-and-white and color cinematography. Made of Polaroid, this filter eliminates glare and unwanted reflections from highly polished surfaces, as well as from glass and water surfaces. Depending upon the angle at which it is turned in relation to the sun, the Pola Screen can be used to appreciably darken a blue sky without affecting tone renditions of other colors, thus providing a sky filter for use with color films.

When choosing and using filters, care should be taken that such filters are of the best quality (absolutely clear) and that they are keyt scrupulously clean. At best, a perfectly clear filter will account for a very minute loss in resolution, and any imperfection in the glass or any dirt on the surface will compound this lack of sharpness. Filters that give perfectly satisfactory results when used with ordinary lenses may sometimes produce a fuzzy image when used with telephoto lenses, because the large lens will magnify any previously imperceptible defects or dirt. For this reason, only filters of the very highest quality should be used when making telephoto shots. ■

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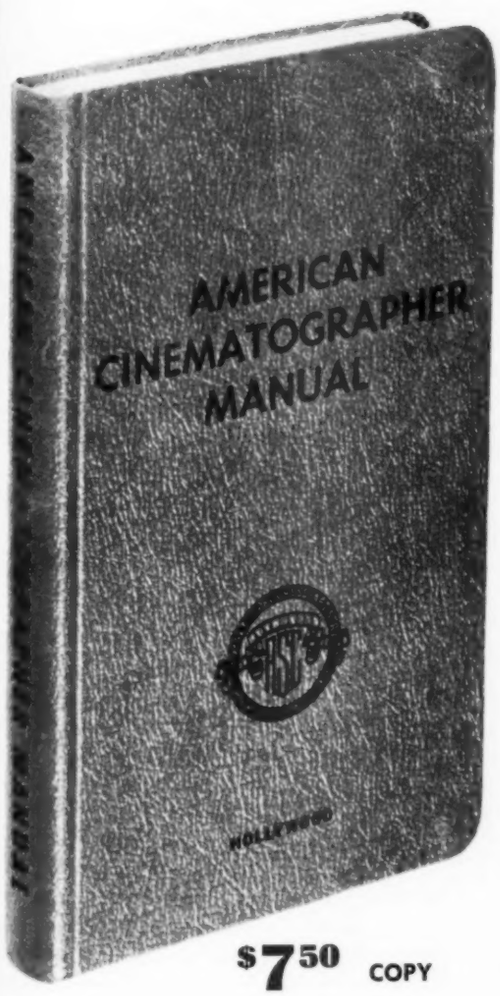

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Depth Of Field*

Its importance in wide-screen cinematography.

THE LACK OF DEPTH of field in a lens is familiar to anyone who has ever attempted to make photographs with lenses of high relative aperture, but there is nevertheless a great deal of misinformation on this subject. This seems to be a consequence of the custom of judging the depth of field from the results of photographic tests, which are seldom conducted in such a manner as to yield results that are really significant. Even if they are, a lens of poor quality has apparently a greater depth of field than a well-corrected one, and the experimental method of determining the depth of field may therefore be very misleading. It is possible to treat this subject theoretically and, as it happens, the rigorous treatment is less complicated than the approximation that is sometimes made.

This subject is particularly timely because of the current industry trend to wide film. The effect on the depth of field, when photographing a subject on wide film, is not immediately apparent. Nor is it apparent that the depth of field may be altered by making a large negative and printing by optical reduction on standard film.

A lens is capable of forming a sharp image of only a single plane of the object space. In practice, however, such factors as the aberrations of the lens or the graininess of the film establish a limit for the useful sharpness, so there is a certain "depth of field" that may be said to be in sharp focus. The depth of field is sometimes called the depth of focus, but the latter term has a different significance in optical terminology.

The depth of field of any lens or optical system is given rigorously by the two expressions

$$d_1 = \frac{rP}{mp - r} \qquad (1)$$

and

$$d_2 = \frac{rP}{mp + r}, \qquad (2)$$

where d_1 represents the depth of field on the far side of the object-plane in sharp focus and d_2 represents the depth of field on the near side. The total depth of field then is:

$$d = d_1 + d_2.$$

In the above equations, r represents the radius of the permissible circle of confusion, P is the distance from the entrance-pupil of the lens to the object-plane on which the camera is focused, m is the magnification of an object in this plane on the film, and p is the radius of the entrance-pupil of the lens.

An erroneous estimate of the depth of field of a lens is sometimes made on the basis of the so-called "hyperfocal distance." This is the minimum distance of an object-plane on which the lens can be focused and still have two objects at infinity appear sharp. In other words, for this condition, the far depth d_1 is infinite. From equation (1), it follows that this condition will obtain when

$$mp - r = 0. \qquad (3)$$

Now, in the Newtonian form of the lens equation,

$$m = \frac{f}{x},$$

where x is the distance of the object-plane in sharp focus from the first focal point of the lens. On substituting for m in equation (3), we have

$$x = \frac{fp}{r}, \qquad (4)$$

where x is the hyperfocal distance measured from the first focal point of the lens. Equation (4) can be written in terms of the f/ number of the lens, since this quantity is the ratio of the focal length to the diameter of the entrance-pupil. On substituting, we have

$$x = \frac{f_2 \cdot f/\text{number}}{2r}. \qquad (5)$$

When equation (3) is satisfied, equation (2) shows that the near depth

$$d_2 = \frac{P}{2}. \qquad (6)$$

Hence, when a lens is focused on the hyperfocal distance given by equation (5), all objects are in sharp focus from infinity to a point half-way between the object-plane in sharp focus and the entrance-pupil of the lens.

Now, a short hyperfocal distance indicates a great depth of field when the camera is focused on the hyperfocal distance. It is sometimes concluded from equation (5), therefore, that the depth of field of a lens varies inversely as the f/ number and inversely as the square of the focal length. This argument takes no account of the fact that the size of the image varies with the focal length, and that a smaller circle of confusion is required for comparable quality in a small picture than in a large one. Furthermore, the lack of depth of field is seldom troublsome when the camera is focused on an object at the hyperfocal distance, but ra-

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Feet	Ft. In. Ft. In.	Ft. In. Ft. In.	Ft. In. Ft. In.	Ft. In. Ft. In.	Ft. In. Ft. In.	Ft. In. Ft. In.
3	2 10 to 3 2	2 10 to 3 2	2 9 to 3 4	2 9 to 3 4	2 8 to 3 5	2 8 to 3 5
4	3 9 to 4 4	3 8 to 4 5	3 7 to 4 6	3 7 to 4 7	3 6 to 4 8	3 5 to 4 10
5	4 6 to 5 6	4 6 to 5 8	4 4 to 5 10	4 4 to 5 11	4 2 to 6 2	4 1 to 6 5
6	5 5 to 6 10	5 4 to 6 11	5 2 to 7 2	5 0 to 7 4	4 10 to 7 10	4 9 to 8 2
7	6 2 to 8 1	6 0 to 8 4	5 11 to 8 8	5 9 to 8 11	5 6 to 9 7	5 4 to 10 1
8	6 11 to 9 6	6 10 to 9 9	6 7 to 10 3	6 5 to 10 8	6 1 to 11 7	5 11 to 12 4
9	7 8 to 10 11	7 6 to 11 3	7 3 to 11 11	7 0 to 12 6	6 8 to 13 10	6 5 to 14 10
10	8 5 to 12 5	8 2 to 12 10	7 10 to 13 9	7 8 to 14 7	7 2 to 16 4	6 11 to 17 10
12	9 9 to 15 7	9 6 to 16 4	9 0 to 17 10	8 9 to 19 2	8 2 to 22 5	7 11 to 25 4
14	11 0 to 19 3	10 8 to 20 4	10 2 to 22 8	9 9 to 24 11	9 10 to 30 7	8 8 to 36 4
16	12 2 to 23 2	11 10 to 24 10	11 3 to 28 4	10 8 to 32 0	9 10 to 42 3	9 5 to 53 9
18	13 4 to 27 9	12 10 to 30 0	12 1 to 35 2	11 6 to 41 3	10 7 to 59 9	10 0 to 85 8
20	14 5 to 32 9	13 10 to 36 0	13 0 to 43 10	12 4 to 53 3	11 3 to 89 6	10 8 to Inf.
25	16 10 to 48 6	16 2 to 56 2	14 11 to 78 0	14 0 to 114 3	12 8 to Inf.	11 9 to Inf.
30	19 0 to 71 11	18 0 to 90 0	16 6 to 162 6	15 6 to 480 0	13 10 to Inf.	13 0 to Inf.
35	20 10 to 109 6	19 9 to 157 6	18 0 to 308 6	16 8 to Inf.	14 10 to Inf.	13 8 to Inf.
40	22 6 to 179 0	21 2 to 360 0	19 2 to Inf.	17 10 to Inf.	15 7 to Inf.	14 6 to Inf.
45	23 0 to 357 0	22 6 to Inf.	20 5 to Inf.	18 8 to Inf.	16 5 to Inf.	15 2 to Inf.
50	25 4 to Inf.	23 9 to Inf.	21 3 to Inf.	19 6 to Inf.	17 0 to Inf.	15 8 to Inf.
60	27 10 to Inf.	25 9 to Inf.	22 2 to Inf.	20 11 to Inf.	18 0 to Inf.	16 6 to Inf.
75	30 7 to Inf.	28 1 to Inf.	24 11 to Inf.	22 8 to Inf.	19 3 to Inf.	17 6 to Inf.
100	34 0 to Inf.	31 0 to Inf.	27 0 to Inf.	24 2 to Inf.	24 7 to Inf.	18 7 to Inf.

TYPICAL DEPTH OF FIELD TABLE which shows at a glance the depth of field of a lens used at different apertures. Such charts may be found in photographic data books, such as the new American Cinematographer Manual.

ther when it is focused on a nearby object. Under the latter conditions, the quantity r in the denominator of equations (1) and (2) becomes negligible compared with the quantity mp. Hence equations (1) and (2) become simply

$$d_1 = \frac{rP}{mp} \qquad (7)$$

and

$$d_2 = \frac{rP}{mp}; \qquad (8)$$

and the total depth of field is

$$d = d_1 + d^2 = \frac{2rP}{mp}. \qquad (9)$$

The ratio P/p in the above equation can be transferred to corresponding quantities in the image-space by means of the well-known relationship in optical theory that

$$m = -\frac{pP'}{p'P},$$

where P′ is the distance of the film from the exit-pupil of the lens and p′ is the radius of the exit-pupil. Equation (9) may then be re-written as follows:

$$d = d_1 + d_2 = \frac{2rP}{m^2p'}. \qquad (10)$$

Now, any comparison of the depth of field of two lenses must be made on a basis that insures the same exposure in both cases, since manifestly any desired depth can be obtained by reducing the lens aperture. It is a well-known fact that the amount of illumination on the film in the image of an extended object is determined by the ratio P′/p′.[1]

Assuming a constant value for this ratio, the depth of field is seen from equation (10) to vary directly with the permissible size of the circle of confusion r and inversely as the square of the magnification. This result is independent of the particular form of the lens.

In other words, *any claim that one lens has a greater depth of field than another is absurd.* If experimental tests seem to indicate a difference between lenses, either the two lenses were not used at the same effective aperture and magnification, or the image quality of one is inferior to that of the other and its depth only appears to be greater.

The lack of depth of field is apparent to the motion picture audience when the size of the circle of confusion on the screen exceeds a certain limiting value. Let us designate by R the radius

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of the largest permissible circle of confusion on the screen. Then

$$R = rm^p m^s,$$

where m^p is the magnification between the negative and positive in printing (in contact printing this quantity is 1) and m^s is the magnification of the film on the screen in projection. Substituting for r in equation (1), we have

$$d = \frac{2R}{m^2 m^p m^s} \cdot \frac{P'}{p'}. \qquad (11)$$

Let us assume now an object or actor of height h in the plane on which the camera is focused. The corresponding height of the image on the screen is

$$H = hmm^p m^s. \qquad (12)$$

Let us designate the over-all magnification between the object and its screen image by M, where

$$M = \frac{H}{h} = mm^p m^s. \qquad (13)$$

With this substitution, equation (11) becomes

$$d = \frac{2R}{mM} \cdot \frac{P'}{p'}. \qquad (14)$$

We see, therefore, that for a fixed value of R and P'/p' the depth of field, as seen by the audience, varies inversely as the original magnification in the camera and the over-all magnificatoin M. In other words, it is just twice as hard to obtain sufficient depth when the actor's head is to be ten feet high on the screen as when it is only five feet high. The advantage of making m small will be dealt with presently.

Let us consider the case of standard 35mm practice where both the negative and positive film are of this width and the printing is done by contact. Equation (14) shows that, for a fixed over-all magnification M, there is a definite gain in making the magnification m, in taking, as small as possible. This implies either using camera lenses of short focal length or placing the camera at a great distance from the actors. For the same over-all magnification M, equation (13) shows that m^s must be increased in proportion to the decrease in m.

In other words, the greatest depth of field is seen to result by making the original negative with as low a magnification as possible and relying on subsequent enlargement to provide the required over-all magnification. The limit to the subsequent enlargement is set by the graininess of the negative material. Unfortunately, this limit has been reached with 35mm negative film, as the magnification in the projector is already so high that any further increase makes the graininess decidedly objectionable. We must conclude, therefore, that the depth of field for a given effective lens aperture P'/p' is about as great as it can ever be made with 35 mm film unless the graininess of the film can be reduced enough to permit greater magnification in projection.

Let us now consider the effect of making the original negative and release prints on a wider film. For the sake of convenience, let us assume the film to be 70mm in width, or twice as wide as the 35mm standard. There are several possible ways of utilizing this increased width, but most producers seem to regard the wider film as an opportunity to include more action on a larger screen, the size of images on the screen remaining approximately as it present.

If this plan is followed, it is obvious from equation (14) that the depth of field with wide film, at the same over-all magnification M and the same magnication in projection, is identical with that obtained in 35mm practice. This implies the use of camera and projector lenses of the same focal length as at present. If, on the other hand, larger images are projected on the larger screen, the increased over-all magnification M can be obtained only by increasing either m or ms. It is impossible to increase m^s without increasing the appearance of graininess. Hence, any increase in M must be the result of increasing m, and equation (14) shows this procedure will decrease the depth of field. This is not exactly true, because a somewhat larger circle of confusion can be tolerated with a larger screen. Nevertheless, the fact remains that larger images on the screen are obtainable only by sacrificing depth of field.

Consider now the case where the negative is 70mm in width and the release prints are to be 35mm in width, the printing being done by optical reduction. Since the quantity m^p in equations (12) and (13) does not appear in equation (14), it follows that this reduction process neither increases or decreases the depth of field when the other conditions are met—that is, when the same magnification m is used in the camera and a final image of the same size is projected on the screen.

Equation (13) shows that when m^p is one-half, as it is approximately under these conditions, the magnification in projection m^s must be twice as great to keep the over-all magnification M the same. It is claimed, with some justice, that this reduction process reduces the graininess and that the magnification in projection m^s can therefore be increased over what is possible when the print is made by contact. If the reduction in graininess is one-half, so that the magnification in projection can be doubled, the depth of field of pictures produced in this way is the same as with the two methods that have been discussed previously.

It is no more difficult to design a projection lens to cover 35mm film than one to cover the 70mm film if they are of the same relative aperture. But, with the same relative aperture, the illumination on the screen with the 35mm film will be approximately one-fourth as great. ■

"CAPTURED MOMENT"

Continued From Page 613

thentic Civil War weapons and other props of that period were obtained from local collectors. Uniforms for the three Confederates had to be made, then aged and torn to match those which appear in the Cyclorama.

The exterior scenes were shot on Ektachrome Type 7255 film. The color match between these scenes and those shot earlier on the high-speed film was gratifyingly close. Foil-surfaced sunlight reflectors were used extensively at the Peachtree Creek location to thrown fill light into shaded areas and to soften the shadows on faces. Most of the filming was done with an Auricon Pro-600 16mm camera, with lip-sync sound recorded on 16mm magnetic film.

The premier showing of "Captured Moment" was telecast in color by WAGA-TV, Atlanta, on the anniversary of the depicted battle—July 22nd. Most rewarding for the sponsor was the enthusiastic public acceptance accorded the presentation by Atlanta's video audience. ■

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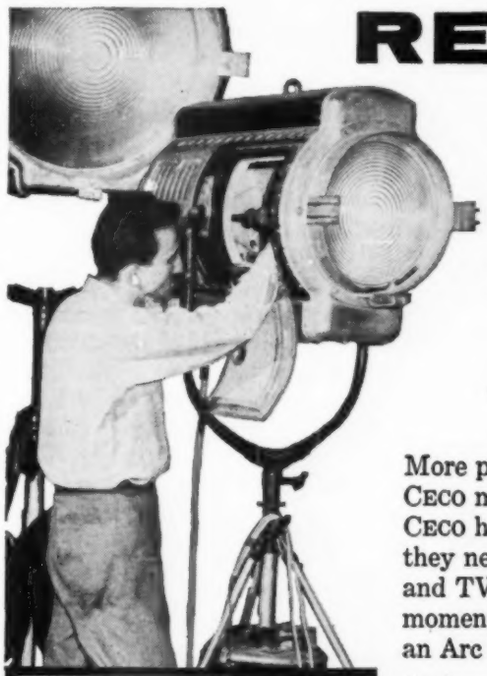

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CONTROLLING PERSPECTIVE

Continued From Page 613

more depth and will keep the foreground area in focus, in addition to lending a measure of separation between the various planes in the picture. Photographers of sports events can benefit from this lens also, because it covers scenes in such a way as to give spectators more of the action.

By using the shorter focal length lens for TV films, the pictorial perspective obtained is more compatible with the picture format of today's TV home receivers. Moreover, perspective lines are strengthened and thus make up for some of the detail loss that results in the TV transmission process.

Use of Wide-angle Lenses

The tendency of wide-angle lenses to increase apparent subject motion to and from the camera can be used to advantage at times. A train roaring toward the camera can be given added motion impact when photographed with a short focal length lens. Makers of TV commercials can use the unusual perspective qualities of the wide-angle lens to achieve effects that might otherwise require a zoom lens—as when manually moving the sponsor's product suddenly up close before the lens. Use of the wide-angle lens will accentuate the forward motion most effectively for shots of this kind.

Dolly shots, when made with a trackless dolly, are more effective when made with a short-focus lens; the shorter the focal length of the lens used, the less the dolly must be moved to produce the desired change in image size.

When shooting out of doors, short focal length lenses tend to take in more foreground than longer lenses. Conversely, the foreground area in front of the camera can be diminished by shooting from a lower angle and tilting the camera up a bit. This is a useful fact to remember when a shot, as seen in the finder, appears to have excess foreground area.

Settings or scenes that would look cramped when filmed in 16mm with a standard (one-inch) lens can be made to appear larger simply by shooting with a wide-angle lens. There will be more separation apparent between the people in a scene and walls of the room (if the shot is an interior) will not appear so enclosing.

Where it is desired to give a set, a room, etc., larger appearance, the desired result can be achieved by using a wide-angle lens and lowering the camera angle.

The perspective that is obtained with the one-inch lens, which is generally supplied as "standard" on most 16mm cameras, is approximately that seen by the human eye. Therefore, it is a safe lens to use for most purposes where a forced perspective is not essential. With such lenses, there's no danger that you will get the awkward perspective, abberations and distortions that sometimes occur when lenses of shorter focal length are used.

Long focal length lenses, of course, produce an opposite effect on perspective; for example, it is common in Hollywood studios to photograph close-ups with a 75mm lens. Result is a player's face is pictured with utmost flattery; and the fact the cinematographer doesn't have to work right up close to the player with the camera induces a more relaxed portrayal. With few exceptions (like people with uncommon flat faces), almost anyone will look better on the screen when filmed in closeup with a lens of long focal length.

The only reason that longer focus lenses can give better perspective is that they make it possible to form an image *of the same size* at a greater distance from the subject, thus avoiding the unpleasant perspective that they, too, would produce if they were to be used at the shorter distance.[3]

New Problems Introduced

When it comes to photographing long shots with longer lenses, new and different problems are introduced; scenes have a tendency to look "cluttered," especially if there are several different planes of subject matter in the picture area.

This "cluttered" effect can be turned to good advantage, however, when filming certain scenes. A shot intended to show congested traffic moving slowly along a highway or street can be given an added aspect of "congestion" by shooting the scene with a lens of long focal length. Scenes of marching soldiers have been made to appear more dense when shot with a six- or eight-inch lens.

For the most critical work, it is advisable that photographers working with an assortment of lenses ranging from wide-angle to telephoto, have each one balanced or re-calibrated to insure uniform exposure at a given stop. In this way, if a meter reading indicates a stop of, say f/8, all the lenses can be used interchangeably set at f/8, with full confidence that exposure results will be identical with all lenses.

It has not been uncommon to find top quality lenses varying as much as one full stop when put on the test bench. It would, therefore, be shortsighted of the photographer to work for perspective control without first taking steps to insure uniform photographic quality between shots by having his lenses checked and re-calibrated where necessary.

Finally, perspective is not solely a product of the right camera lens used in the right camera angle or set-up. Psychlogical and emotional factors play an important part, also—all of which can be confirmed by the serious photographer through experiment and application. ∎

References:
1, 2: *Cameras and Lenses*, Ansel Adams, Morgan & Lester, 1948.
3: *An Introduction to the Science of Photography*, K. Chamberlain, Macmillan, 1951.

SHORT-WAVE SHORT-CUTS

Continued From Page 608

cameras, as long as their operational pattern (starting and stopping) is uniform and simultaneous.

As with all radio transmitting equipment, a simple permit for operation is required by the Federal Communications Commission. However, no technical knowledge of radio is necessary nor is an examination required. Anyone can use the equipment following a reading of the instructions for its operation furnished at the time of purchase.

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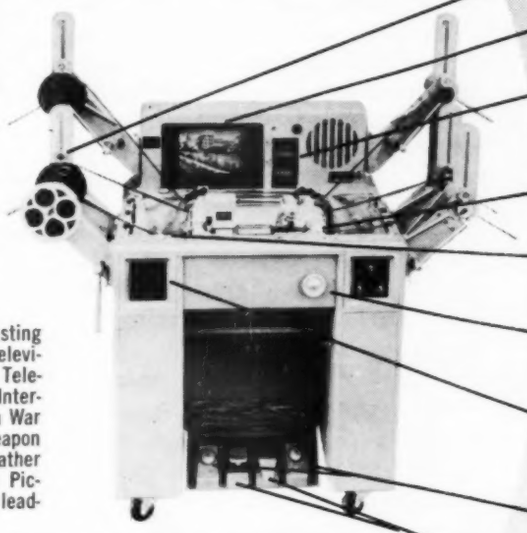

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The camera illustrated with the equipment in Fig. 3 is a converted "GSAP" camera obtained from a war surplus outlet. The low cost of this magazine-load camera makes it easily "expendable" in the event it is lost or badly damaged in use. Where Commercial Ektachrome film is to be used, it becomes necessary for the user to load the magazines himself, as this film is not presently supplied in magazines.

The complete radio control unit, which includes transmitter and receiver, can be purchased from almost any hobby shop or model supply dealer, and there are a number of makes to choose from. The equipment illustrated is manufactured by Babcock Engineering Co., Burbank, Calif. which company originally developed it for the government. Similar equipment is also available in kit form for assembly by the user. ■

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"HAWAIIAN EYE"

Continued From Page 603

shoot scenes for "Hawaiian Eye" in Honolulu, and later at the Warner Brothers studio in Burbank. We felt sorry for him and his crew for what we believed was undue pressure being applied by the director and others. Yet close observation revealed that the imperturbable DuPar was always completely tranquil, never hurried, never excited. And somehow each shot was set up, photographed, and the camera then moved to the next set-up before one realized what was going on! Vastly different from the procedure of shooting a feature film.

A New Awareness

Television film production has brought a new awareness to the Hollywood motion picture industry—an awareness that films can be made faster, more economical, and with no loss in quality as a consequence. As one technician put it: "It's simply a matter of 'getting off the dime' and getting going; of scrapping old methods, old thinking, and pursuing the new."

The locale for all "Hawaiian Eye" shows is Honolulu, Hawaii—and more specifically, the Hawaiian Village Hotel and environs where Bob Conrad as "Tom Lopaka" and Anthony Eisley as "Tracy Steele" conduct a detective agency and also act as hotel security officers. While much of the main action for the various shows centers here, contributory and evolutionary action may take place anywhere on any one of Hawaii's five larger islands.

About once a year, the "Hawaiian Eye" cast and production staff fly to Honolulu to shoot a number of shows, and in between, as much background and stock shot footage as time permits. The day we arrived at the Hawaiian Village Hotel, the latter part of May, the company was busy in the hotel forecourt shooting scenes involving Conrad and Eisely for a show that will be televised later this year. The pace at which the company worked was impressive to anyone who has observed features being filmed on a Hollywood sound stage. There was no lost motion at any time. Director Lee Sholem would tell DuPar where he wanted the camera and give him a brief outline of the action. DuPar's crew would have the camera moved and in place before Sholem stopped talking. Camera Operator Bob Tobey, ASC, meantime would line up the camera and by the time DuPar had walked over for a look through the finder, the camera was ready to roll. If you stopped to look around at some pretty girl passing by, when you looked back you likely discovered the shot had been made and already the camera was being moved to a new set-up. Rarely did the director ever call for more than a single rehearsal, and the "take" followed immediately. As one observer remarked: "They shoot scenes faster than movie amateurs do!"

That same afternoon, the company shot half a dozen scenes in the hotel area, then loaded cameras, equipment, and cast into cars and sped to another location not far distant for a few more scenes; then returned to the hotel grounds about an hour later for more shots there. Following dinner, all returned to the hotel forecourt once more where a number of night scenes —"entrances" and "exists," DuPar called them—were shot.

In the days that followed, we found that we were either following or were being followed by the "Hawaiian Eye" company as we traveled to the Island of Hawaii, and then to Kauai, and back to Honolulu.

Filming A Native Ritual

Utilizing a chartered Aloha Airlines Jetprop F-27, the crew with all of the equipment brought from Hollywood, flew the 170 miles to Kailua, Kona, on the Island of Hawaii. Here they worked all day shooting action scenes or background plates at the Kona Airport, Kailua town street scenes, Kona Inn Hotel, Kailua Bay and finally in a charter boat cruised down to Kealakekua Bay for scenes of the rugged coastline. The company did not stop shooting until sundown, and it was late when they returned with their equipment to Honolulu.

Two days later, they repeated the performance, taking off at 6 a.m. and flying via Aloha Airlines 102 miles to the island of Kauai. Here they filmed airport sequences, Lihue town street scenes, the Kauai radio station, Garden Island newspaper office, Coco Palms Hotel grounds and the Wailua River excursion boats.

One of the interesting photographic undertakings we observed here was shooting the native ritual that takes

place each evening on the palm-studded grounds of the Coco Palms. Nightly, at sunset, Hawaiian youths clad in colorful red lava-lavas lower the Hawaiian state flag, blow notes on conch shells, and beat a slow rhythm on a huge drum. After the flag is lowered and folded away, other boys carrying lighted torches race along the banks of a tiny stream that threads its way through the grounds, and in between the towering coco palms, igniting tongo torches and fire pots set in the lawn between the trees. The effect is impressive; the whole area is bathed in a golden glow from the flaming torches and firepots. It inspired Director Lee Sholem to put it on film for a future show in the "Hawiian Eye" series.

The next evening, DuPar gathered his cameras and crew together, had his gaffer mount some portable Garnelites to supply a measure of fill light, and the whole ceremony was re-enacted for the camera and recorded on Tri-X film.

Arriflex 35mm Camera Used

The following day we set out early in a Wailua River excursion boat for a trip to the island's famed Fern Grotto. We were only minutes away from the landing when a small motor launch loomed behind us bearing DuPar's camera crew. Operator Bob Tobey was crouched in the stern with a hand-held Arriflex 35 shooting scenes of our boat moving up the river, its arrival at destination, and miscellaneous stock-shot and background plate footage.

On location trips such as this, the "Hawaiian Eye" production crew travels light and fast. Both Color-Trans and Garnelites make up the bulk of their location filming lighting equipment, although heavier studio lights are used frequently when shooting night scenes in Honolulu and around the Hawaiian Village. While most of this lighting equipment is brought from Hollywood, Tommy Matsumoto, Honolulu cameraman, film producer and equipment renter, often supplies additional equipment and sometimes works with DuPar's camera crew.

According to DuPar, during the two weeks the company filmed in the islands this year, over 110,000 feet of negative was exposed—mostly Plus-X. The film that is shot daily is flown to the laboratory in Hollywood each night. There are no "dailies" supplied on this type of filming operation, he said.

The show's producer, Stanley Niss, believes that one of its big assets is the fact that each weekly segment brings to video audiences beautiful views of tropical Hawaii, and to former visitors nostalgic glimpses of scenes and places they had previously visited. Thus, authenticity is of paramount importance in all the presentations. Few, if any, exterior scenes that appear in "Hawaiian Eye" are studio-contrived. One of the chief reasons, therefore, for sending the company periodically to Hawaii is to permit key action to be staged and filmed in actual locales, and to obtain background footage that will enable the company to complete shooting that action on the sound stage against backgrounds or on sets duplicating in every detail actual Hawaiian locales.

At Warner Brothers studio, one sound stage is entirely occupied by permanent sets for the "Hawaiian Eye" series. Here, spread over the entire stage floor, are such exterior sets as the Hawaiian Village hotel forecourt, Shell Bar entrance, swimming pool, entrance to the Hawaiian Eye offices, etc. Interior sets include the Shell Bar—built in exact replica of the original in the Hawaiian Village hotel—orchestra and dining area of the bar, interior of Hawaiian Eye offices, and the hotel lobby.

The many advantages of such a set-up are obvious. As Ed DuPar explains it, "We can shoot a minimum of each show in entrances and exists on location in Hawaii, then pick up the action later in closer shots here on the duplicate sets on the sound stage. This enables us to shoot faster on location, and to shoot all scenes which require important lighting in the studio where we can control the illumination and also have access to all the other conveniences a sound stage affords."

Teamwork Is Secret

Earlier, we asked Ed DuPar how it was possible to work at such a pace and under such apparent pressure and still get quality into his photography.

"The key to this," he replied, "is that I have a dependable and experienced crew. My gaffer, for instance, has been with me for 15 years. I never have to tell him a thing. When the director comes on the set and tells

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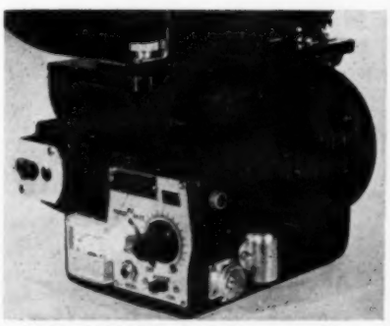

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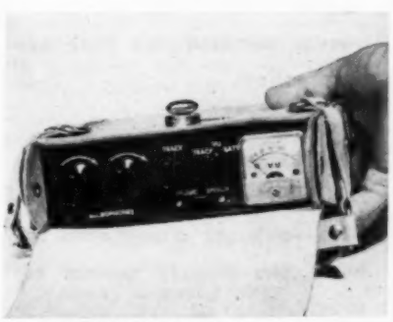

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me what he wants, my gaffer is right alongside. We make a few marks on the floor indicating where the actors will stand and how they will face, then he goes ahead and places the lights accordingly. Meantime, I lay out what I have to do as regards the camera, etc."

"Teamwork," he concluded, "is what does it. You can't go any faster than the men who work with you." ■

EDITING A & B ROLLS

Continued From Page 605

serves to "piece out" either film strip during the editing procedure so that the length of the two remain constant. Where a length of film (a scene) is intercut on the "B" roll, for example, a corresponding length of white leader is cut into the "A" roll strip to equalize its length with the "B" roll strip. (See "Checkerboard Technique" in Fig. 1).

When the next dissolve symbol appears on the work print, as the film is advanced during editing, a switch-over is again made to the "A" roll, allowing the prescribed 48-frame overlap as before. This procedure continues for the entire reel (of work print) so that some original scenes are on the "A" roll and the others on the "B" roll—with white leader filling out the opposite roll to correspond with each insert of original footage. Thus, a 400-foot reel of work print will be "matched" with two rolls of original scenes—the "A" and "B" rolls.

When the laboratory receives this material and makes the release print, the "A" roll is first printed for its entire length. A cueing device on the printer automatically turns on the printer light as each section of original film enters the printer gate, and extinguishes it when the leader sections are going through. In this way, the various sections represented by the leader are left unexposed, so that corresponding scenes on the "B" roll can be exposed on the print in its second pass through the printer. On examination, the finished print appears to have been printed in its entirety in one pass through the printer, with no variations or lines of demarcation between the printing steps evident anywhere.

But we are getting a little ahead of ourselves here. After the "A" roll has been printed, the roll of partially-exposed positive or duplicating film is wound back to the beginning, then threaded up in the printer again and sync established. Roll "B" is then threaded in the printer where it will contact the positive film now bearing the "A" roll exposures and the scenes thereon printed in the areas left unexposed during the "A" roll printing operation.

During both the "A" roll and "B" roll printing operations, the necessary fades are automatically made to produce the 48-frame dissolves.

Fades between scenes can be printed in two ways: 1) by switching over from "A" roll to "B" roll, or 2) the scenes to be faded can be cued to fade without switching over from one roll to the other. The first method is preferred because the dissolves are clearly indicated by symbols placed on the film by the editor to indicate that a fade is planned. Also, it permits the introduction of a variable length of all-black in the print—between the fade-outs and the fade-in.

With the second method, some definite indicator must be placed on the film where a fade is to be made—usually a piece of tape applied across the splice between two original scenes, with the word "fade" written upon it.

Still other optical effects are possible when a film is prepared for printing by the A & B roll method. A title can be printed or superimposed over an action background, as follows: a title strip having white letters on a black background can be cut into the leader in the roll, opposite the scene over which the title is to be printed. White letter titles are preferred and the lettering should be so photographed that it will appear over the darkest portion of the scene. In a similar way, other superimposures are possible—such as an arrow to point out some important object in a scene, etc.

Use of C, D, and E Rolls

Another variation of the superimposed title procedure described above, is to splice about thirty frames of black leader to the head of the title, so that the printer can fade-in over the black leader, causing the title to "pop on" instead of fade in.

Sometimes "C," "D," and "E" rolls are also assembled for a picture where it is desired to obtain a greater number of multiple exposures or optical effects in the printing process. Opening titles, for instance, can be dissolved "A" to "B" while correspond-

ing action background scenes are simultaneously dissolved by means of "C" and "D" rolls.

Earlier, reference was made to the series of symbols for marking A & B rolls established by the Association of Cinema Laboratories, Inc. This marks the first concerted effort by the industry's leading film laboratories to secure the cooperation of film makers towards standardizing their methods on pre-print preparation of films.

Ten Recommendations

In the preparation of original 16mm A & B rolls, there are ten specific recommendations:

Black Leader: It is recommended that only black leader be used between scenes and that such leader be fully opaque. Black leader should be used for *negative* A & B rolls also.

Double or Single Perforated Leaders: Only double-perforated leader should be used when all the original is double-perforated. When some or all of the original is single-perforated, the use of single-perforated black leader is recommended to prevent possible future damage to the original. The perforations in the black leader should, of course, be on the same edge of the film as those in the original.

Invisible Splices: In order to make 16mm splices invisible on the screen, it is recommended that the A & B rolls be prepared using the "checker board" technique. (See Fig. 1). This is accomplished by alternating the scenes back and forth on the A & B rolls. The splices should be made in a splicer that makes one of the cuts on the frame line and the other cut in the picture area. When splicing the scene to black leader, the scene should be placed in the splicer in such a manner that the scraped portion and visible cut of the splice occur only in the black leader. After splicing the head of the scene in this manner, in order to correctly make the splice at the "tail" of the scene, it will be necessary to turn the scene around in the splicer.

Fades: When a fade-out is followed by a fade-in, it is recommended that the fade-in scene be carried across to the other roll without any overlap. The procedure is the same as that followed in preparing for "invisible" splices. Instructions must be given so that the fades will be printed in at the desired places.

Dissolves: It is suggested that 48 frames be used as a standard overlap in preparing A & B rolls for dissolves. (Fig. 1.) This does not necessarily mean that the length of the printing effect will be 48 frames, but it will permit laboratories to make dissolves of varying lengths up to two seconds duration.

Some laboratories request that a number of extra frames be left on the head and tail of each scene in matching. For this reason the laboratory used should be quizzed and their recommendation followed.

Series of Effects: When dissolves or fades follow each other at very short intervals, caution should be exercised; for the film editor should remember that on a single roll, no new effect can be started before the last effect is completed. It is impossible, for example, to start a fade-out after a fade-in until the fade-in cycle is completed in the printer. With a standard of 48 frames overlap, it is recommended that the minimum length of a scene that incorporates an effect at each end be no shorter than 108 frames in the original A & B rolls—i.e., 48 frames for the fade-in and 48 frames for the fade-out, plus an additional 12 frames as a safety factor. This scene, in the cut work print, would then be no shorter than 60 frames.

Dissolves Following Cut-Across: If a dissolve or fade follows black leader after a cut-across scene in the original A & B rolls, it is recommended that the black leader be no shorter than 54 frames. This allows 48 frames for the mechanical fader to fade out in order to be ready for the fade-in on the beginning of the following effect scene. The 54 frame length allows 6 frames as a safety factor. The same recommendation applies when the effect precedes the cut-across.

Emulsion Side Marked

Marking Dissolves: It is suggested that the middle of each dissolve be marked by making a small "x" in each of two adjacent frames in the center of each fade, on both the A & B rolls. These marks should be made on the emulsion side of the film—outside the picture area. They will appear in the center of the effect on the perforated edge of the film (not the track edge). The two "x" marks in the "A" roll will then be exactly opposite the two marks in the "B" roll, when both rolls are placed correctly in a synchronizer.

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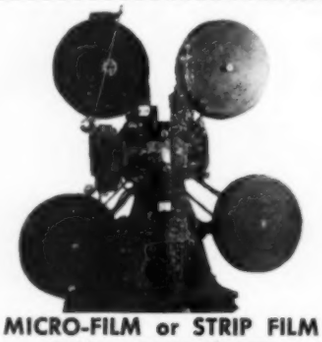

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Thus, the dissolve overlap can be easily checked and correct synchronization of the rolls verified. The emulsion can be scraped by a scriber to form the "x" marks or they can be made with a pen and white, waterproof, quick-drying ink.

Splices: The original should be spliced with the utmost care. Before splicing any original, several test splices should be made in order to check splicer for correct alignment and for depth and width of the scraped area of the film.

Fade-in: A fade-in should be indicated by two straight lines forming a long "V." The two lines should run diagonally for the length of the effect from the edges of the film and converge at the center of the frame at the point of scene change.

Fade-out: The procedure is the reverse of that for the fade-in—the lines extending for the length of the effect and meeting at the center of the frame at the point of scene change to indicate where the screen will be totally dark.

Dissolve: A dissolve is in actual practice a fade-in of one scene superimposed over a fade-out of another. To indicate a dissolve on a workprint, the markings should be the same as those used for a fade-in and a fade-out, but they should in this case overlap each other, as shown in the diagram. The mid-point of both markings should occur at the splice in the work print and the markings should extend an equal distance into both scenes.

Double Exposures: Double exposures, superimposed titles, etc., should be indicated by cutting into the background scene of the work print a few inches of edge-numbered work print of the new superimposed scene, to indicate where the double-exposure begins. Several inches of the superimposed scene should then be cut in to indicate the end of the double exposure. These two pieces should be connected together by a wavy line.

To insure proper matching, it is essential that one of these small pieces of work print be edged-numbered or identified in some way.

Extended scenes: Scenes to be extended in matching and so indicated in the work print by leader should be marked with a long arrow, the shaft of which is drawn through the leader and the head of which comes up to the last frame of the leader to indicate the length of the extension.

Unintentional Splices: Splices occurring in the work print that are to be disregarded in matching should be indicated by two short parallel straight lines drawn through the splice and at right angles to it. This indicates that the scene is not to be cut at that point.

The foregoing should provide the film editor or producer with a clear understanding of the various A & B roll editing procedures and enable him to so prepare his 16mm films for the laboratory that prints of high professional quality will result. ∎

ZOOMING TECHNIQUE

Continued From Page 614

frame, as shown in Fig. 1a, *providing that the zoom lens was properly aligned with the subject before filming of the zoom shot was begun.*

Figure 2 shows the same scene, but with the cross and spire very slightly off center—so slight as to be almost imperceptible to the eye sighting through the lens finder. In the illustration, the amount of horizontal displacement is shown at a, and the vertical displacement at b.

When the lens is zoomed from the wide-angle thus aligned to the telephoto view (enlarged five times) shown in Fig. 2a, the displacement indicated at a and b in Fig. 2, is increased proportionately, as shown at 5a, and 5b in Fig. 2a. Here the changed position of the spire and cross, away from center of the frame, is quite apparent —yet this was in no way caused by any defect in the zoom lens used.

The problem can be avoided by making a "dry run" with the zoom lens on the subject to be filmed, so that the camera can be so aligned with subject that it will remain in the center of the frame during and after the zoom operation—either in or out.

The point to remember is: always focus and frame the scene or subject to be filmed with the zoom lens in *telephoto position.* The displacement problem illustrated cannot be avoided; but by eliminating it entirely in the magnified scene (produced by the zoom lens in telephoto position), the slight error in centering—if any—in the wide angle framing will not be

obvious, because the center subject in scene will now be much smaller and less liable to comparison with the center line of the frame.

A scene framed as prescribed above may be zoomed in either direction (in or out) with no undesirable center displacement evident.

Focusing of a zoom lens should also be done with the lens set in the maximum telephoto position. Where focus is set with the lens in the wide-angle position, it is possible that, because of the greater depth of field of the wide angle lens, the main subject may be so positioned as to be in sharp focus in the wide-angle position, but be completely outside the depth of field range of the lens when it is zoomed to the telephoto position, when depth of field is greatly reduced. ■

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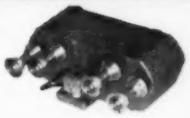

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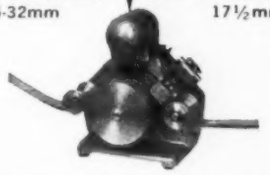

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WILLIAM SPENCER, "Peter Gunn"* (Spartan Prods.) with Craig Stevens and Lola Albright.

BILL CLOTHIER, "Ring of Fire" (C'Scope & Color; Andrew & Virginia Stone Prods.; shooting in Oregon) with David Janssen and Joyce Taylor.

JOHN NICHOLAUS, "Rawhide"* (CBS-TV) with Eric Fleming and Clint Eastwood.

DALE DEVERMAN, "One Step Beyond"* with John Newland.

WILLIAM MARGULIES, ASC, "Bachelor at Large"*

HARKNESS SMITH, "The Outlaws"*

GEORGE CLEMENS, ASC, "Twilight Zone"* (Cayuga Prods.)

NICK MUSURACA, ASC, "The Islanders"* with William Reynolds and James Philbrook.

STUART THOMPSON, ASC, "National Velvet"* (Velvet Prods.) with Lori Martin and Ann Doran.

N.B.C.

ALAN STENSVOLD, ASC, "Dinah Shore Pacific Show"* (Sewanee Prods.; Tahiti); "Groucho Marx Show" (Film Craft Prods.) "Roy Rogers Show" (Sewanee Prods.; Pomona Fair.)

PARAMOUNT STUDIOS

WILLIAM SNYDER, ASC, "Bonanza"* (NBC-TV) with Michael Landon and Dan Blocker.

JEAN BOURGOIN, "The Counterfeit Traitor" (Technicolor; Perlberg-Seaton Prod.; shooting in West Berlin) with William Holden and Lilli Palmer. George Seaton, director.

FRANK PHILLIPS, "Have Gun Will Travel"* with Warner Anderson and Tom Tully.

RAY FOSTER, ASC, Commercials*.

PARAMOUNT SUNSET STUDIOS

FLEET SOUTHCOTT, "Gunsmoke"* with James Arness and Dennis Weaver.

REPUBLIC STUDIOS

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MAX GREENE, "The Secret Ways" (Heath Prod.; shooting in Vienna) with Richard Widmark and Sonja Ziemann. Phil Karlson, director.

WILLIAM DANIELS, ASC, "Come September" (PanaVision & Color; Seven Picts., UI Prod.; shooting in Italy) with Rock Hudson and Gina Lollobrigida. Robert Mulligan, director.

HOWARD SCHWARTZ, "The Rifleman"* (Four Star Prods.) with Chuck Connors and Johnny Crawford.

KENNETH PEACH, ASC, "Michael Shayne"* (Four Star Prods.) with Richard Denning.

HARRY WILD, ASC, "Peter Loves Mary"* (Four Star Prods.) with Peter Lind Hayes and Mary Healy.

CHARLES BURKE, KIT CARSON, "Wanted Dead or Alive"* (Four Star Prods.) with Steve McQueen.

EMMETT BERGHOLZ, "Death Valley Days"* (Filmaster Prods.).

WILFRID CLINE, ASC, "Stagecoach West"* (Four Star Prods.) with Wayne Rogers and Richard Eyer.

JOSEPH LA SHELLE, ASC, "The 6th Man" with Tony Curtis and James Franciscus. Delbert Mann, director.

GEORGE DISKANT, ASC, "June Allyson Show"* (Four Star Prods.) with June Allyson.

KIT CARSON, "The Tom Ewell Show"* (Four Star Prods.) with Tom Ewell and Marilyn Erskine.

REVUE STUDIOS

ELLIS THACKERY, ASC, NEAL BECKNER, "Bachelor Father" (Bachelor Prods.) with John Forsythe.

WILLIAM SICKNER, ASC, "The Deputy"* (Revue Prods.) with Henry Fonda; Commercials* (Revue Prods.)

LIONEL LINDON, ASC, RAY CORY, ASC, "General Electric Theatre"* (Revue Prods.)

RAY RENNAHAN, ASC, JOHN RUSSELL, ASC, Lincoln-Mercury Special* (Color; Revue Prods.)

EMIL HARRIS, "Riverboat"* (Revue Prods.)

JACK MACKENZIE, ASC, GILBERT WARRENTON, ASC, "Laramie"* (Revue Prods.)

JOHN RUSSELL, ASC, NEAL BECKNER, "Alfred Hitchcock Presents" (Revue Prods.)

GILBERT WARRENTON, ASC ELLIS THACKERY, ASC, "Wells Fargo"* (Overland Prods.) with Dale Robertson.

ELLIS THACKERY, ASC, "Tall Man"* (Revue Prods) with Barry Sullivan.

LIONEL LINDON, ASC, JOHN RUUSSELL, ASC, IRVING LIPPMAN, "The Thriller"* (Revue Prods.)

NEAL BECKNER, LIONEL LINDON, ASC, "Shotgun Slade"* (Revue Prods.)

RAY CORY, ASC, "Bringing Up Buddy"* (Revue Prods.)

IRVING LIPPMAN, "Johnny Midnight"* (Midnight Prods.) with Edmund O'Brien.

BENJ. KLINE, ASC, "Wagon Train"* (Revue Prods.) with Ward Bond.

RAY RENNAHAN, ASC, "Laramie"* (Revue Prods.)

RAY FLIN, "Whispering Smith"* (Revue Prods.)

MACK STENGLER, ASC, WALTER STRENGE, ASC, "Leave it to Beaver"* (Gomalco Prods.) with Barbara Billingsley and Hugh Beaumont. Norman Tokar, director.

JOHN WARREN, ASC, "Checkmate"* (J&M Prods.) with Anthony George.

TWENTIETH CENTURY-FOX

LEE GARMES, ASC, LEO TOVER, ASC, "Misty" (C'Scope & Color) with David Ladd and Arthur O'Connell. James B. Clark, director.

JAMES WONG HOWE, ASC, "Tess of the Storm Country" (C'Scope & Color) with Diane Baker and Lee Phillips. Paul Guilfoyle, director.

WILLIAM MELLOR, ASC, "The Big Gamble" (C'Scope & Color; Darryl Zanuck Prod.; shooting in Europe) with Stephen Boyd and Juliette Greco. Richard Fleischer, director.

Continued on Page 634

CLASSIFIED ADVERTISING

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STUDIO & PRODUCTION EQUIP.

Mole-Richardson MR-90 Hi-Arc with stand	$ 500.00
Mole-Richardson MR-170 Hi-Arc with stand	750.00
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M-R Senior Spots 5KW heads each	70.00
M-R Junior Spots 2KW heads each	50.00
220-volt, 3-phase interlock motor for Mitchell NC or BNC	350.00
Same as above for Standard Mitchell	200.00
220-volt, 3-phase sync motor for Standard Mitchell	250.00
New ESCO ¼-hp, 220-volt, 3-phase sync motors	60.00
New Blue Seal 35mm optical recorders	1750.00
Above with Modulite VD galvanometer	2250.00
With RCA Variable Area galvanometer	2500.00
Simplex 4 Star 35mm re-recorder, sync motor, pedestal & magazines. Optical and Magnetic	795.00

BLUE SEAL SOUND DEVICES
P.O. Box 472 New Canaan, Conn.

BRAND NEW 35MM ARRIFLEX CAMERA MODEL II-A, 180° SHUTTER WITH THE NEW HEAVY DUTY MOTOR. FACTORY EQUIPPED TO TAKE THE BAUSCH & LOMB CINEMASCOPE ATTACHMENT LENS, THE GROUND GLASS IS ALSO MARKED FOR TELEVISION. 7 LENSES, 6 MAGAZINES, 1 MITCHELL MATTE BOX AND BRACKETT ARMS TO FIT THE ARRIFEX, PLUS 2 OTHER MATTE BOXES. 1 ARRIFLEX TRIPOD, MODEL 35, 2 BATTERIES, 1 TRICKLE CHARGER, SPECIAL REINFORCEMENT ON CASES AND MANY OTHER EXTRAS. COST $8,000.00 — OPEN FOR ANY REASONABLE OFFER. FOR FULL INFORMATION CALL OR WRITE: TILL GABBINI, 2452-A CORINTH AVENUE, LOS ANGELES 64, CALIFORNIA. TELEPHONE: GRanite 7-5312.

35mm Bell & Howell Eymo camera, 47mm f2.5 Comat lens $95.00, 4 inch f2.9 Cinemat lens for Eymo $29.50, 3¾ inch f3.3 Taylor Hobson lens for Eymo $27.50. Cine Special I with eye-level reflex focuser, f1.9 lens, case, extra 100 ft. magazine $315.00. Cine Special II f1.4 Ektar lens, extra 100 ft. magazine, combination case $795.00.

16MM ARRIFLEX CAMERAS AND ACCESSORIES IN STOCK. Close-up attachment for Bell & Howell 8 and 16mm cameras $19.00. Close-up lens extension tube set for Kodak 8mm model 90 camera $12.50. Kodak 16mm magazine focus finder $35.00. Kodak 8mm magazine focus finder $29.50. Bolex Cine-Focus for Bolex 16mm cameras $12.50. WESTEN'S, Inc., 800 State Street, Santa Barbara, California.

FOR SALE, Auricon Pro 16, perfect, complete, Bolex thru-the-lens viewing zoom F/2.3 NR-22 amplifier with batteries, like new Auricon mike, all cables and fittings like new. Price, $950.00. Without lens and viewfinder, $750. Will accept Cine Voice in trade. W. G. CAVANNAUGH, 421 Brevard Ave., Cocoa, Fla. Phone, NEton 6-7343.

LENSES "C" MOUNT. Finest quality 6 element Hexanon 50mm f:1.9, $99.95. Alta 50mm f:2.0, $69.95. Sol. 3" f:1.5, $79.95. Sol. 15mm w/a f:1.9, $39.95. 17mm f:2.5, $19.95. Kinegon 80mm f:1.8, $99.50. 135mm f:3.5, $69.95. Title board and 263 letters 1" high, $2.95 per set. MYERS, 623 Gay, Knoxville, Tennessee.

COMPLETE rack and tank lab. 4-400' racks cypress, 10-100' racks, 2 stainless steel tanks, 12 gal. capacity, 1-1600' portable drying drum, ball bearing shaft. Photos for $1.00. Complete lab for $150.00, original cost, custom built, $1,500.00. Give up photography. SANCENITO, Box 206, Passaic, New Jersey.

8MM LENSES "D" MOUNT. Rexer 13mm f:1.4, $29.00. 25mm f:1.9, $25.00. 38mm f:1.4, $27.00. 38mm f:1.0, $89.95. 5.5mm f:1.4, $49.95. Nemirar zoom lens f:2.5, $69.95. Proskar 8mm anamorphic lenses, special $29.95 with adapters. Trick lenses, set of three, $14.95. MYERS, 623 Gay, Knoxville, Tennessee.

16MM MAURER Model 05 camera complete w/235 degree dissolving shutter, view finder, new type sunshade and filter holder, two 400' magazines, synchronator and case. In excellent condition. Priced for immediate sale—$1,795. IRVING DEUTCH, 18-50 211 St., Bayside, New York.

IMMEDIATELY available: Zeiss microscopes, photomicroscopes. New models 16mm Siemens "2000" magnetic-optical sound projectors. Arriflex 16mm cameras, etc. For top quality, best prices. JOHN TYLER, 603 Alta Avenue, Santa Monica, Calif. EX 5-8876.

STUDIO & PRODUCTION EQUIP.

2—WALL 35mm cameras, late type, double movement with magazines and lenses. One excellent condition, other as new. Details and prices on request. JACK WALTON, P.O. Box 1457, Tampa, Fla.

See S.O.S. Specials on Pages 606 and 607

TRADES TAKEN. Phone PL 7-0440. Cable SOSOUND.
S.O.S. CINEMA SUPPLY CORP.
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Western Branch—6331 Hollywood Blvd.
Hollywood, California
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PRECISION REGISTRATION — USED MITCHELL OR CUSTOM BLIMPED TYPE ON PORTABLE CASTER BASES. COMPLETE WITH SCREENS, INTERLOCKED DISTRIBUTORS, CABLES, INTERCOMS, LENSES, ETC. FULL INFORMATION. PHOTOS AND PRICES ON REQUEST. BOX 1340, AMERICAN CINEMATOGRAPHER.

GOV'T SURPLUS in new condition!! FILM DRYERS 35mmx200 ft. capacity Stineman developing outfits. Eyemo camera lenses. ALL STAINLESS STEEL model A-11B Houston developers. Also K-1A's for reversal or positive film. AIR PHOTO SUPPLY, Dept. C-1, 555 East Tremont Ave, New York 57, N.Y.

BOLEX Leader, turret handle, third turret stop, filter slot, filter holders, carrying case, rackover, Switar lenses: 16mm F2.5, 25mm F1.5, 50mm F1.4, complete $375.00. Spectra color temperature meter, type A, $100.00. Write Box 1376, AMERICAN CINEMATOGRAPHER.

MITCHELL 35mm single system camera, converted to silent, upright 110V AC-DC motor, 4 lenses, 5 magazines, cables and spares for intermittent, $2450.00. JACK WALTON, P.O. Box 1457, Tampa, Fla.

SURPLUS NICKEL CADMIUM CELLS, guaranteed perfect—1¼v—Make your own batteries—power supplies—only $4.95 each. INTERCINEMA Corp., P.O. Box 3452, New York 17, N.Y.

2—Cine Special I cameras, with 100 ft. magazine, less lenses (Navy cameras) $150.00 and $185.00. JACK WALTON, P.O. Box 1457, Tampa, Fla.

MAGNASYNC 602-C 16mm recorder, $695.00. B & H sound projector with synchronous motor, $395.00. DON DUNN, 26246 Fairview Ave., Lomita, California. Dav 6-4925.

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BELL & HOWELL professional foot splicer converted 16-35mm completely overhauled. Bargain. Photograph on request. G. O. RUSSELL, Box 6474, Jacksonville, Florida.

TWO Wall cameras, 35mm, late type, double movement. With or without equipment. Excellent condition. Details on request. JACK WALTON, P.O. Box 1457, Tampa, Fla.

PRO-Jr. gearhead and cranks, head only, perfect condition. Best offer. LOWE, 1201 Cardinal, Orlando, Fla.

CINE Special Series T. Perfect. 1" lens. $400.00. Write Box 1250, AMERICAN CINEMATOGRAPHER.

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your production and struggle with old or used equipment when we can trade for cash or new equipment. Let us know what you have and what you need.

THE CAMERA MART, INC.
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WANTED — 16mm processing equipment — 35mm portable projectors, 16mm Jan projectors or parts —16mm shorts all types—sound movies. 322 Summit St., Toledo 4, Ohio.

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Cameras — Lenses — Equipment
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Continued On Next Page

Classified Ads

Continued From Preceding Page

SERVICES AVAILABLE

LINWOOD DUNN, ASC, offers background of 28 years of experience as specialist cinematographer with RKO Studios to production companies for creative and unusual assignments in fields of special photographic effects, cinematography, equipment design and specialized laboratory techniques. Current assignments, "West Side Story," "Space Ship," "2160." 1153 N. Highland Ave., Hollywood 38, Calif. Phone HOllywood 9-5808. Cable FILMEFX.

SOUND RECORDING SPECIALIST 15 years experience recording on wire, disc, optical film, ¼" tape and 16mm magnetic film. Have done mixing, dubbing, orchestra pickups, radio remotes, motion picture sound tracks, etc. Also have produced a couple documentary motion pictures and TV spots. Am now doing the above for producers and radio stations here in St. Louis. Would like permanent position with a reliable firm. FRANK C. RUNYAN, 9762 Lilly Jean Dr., St. Louis 34, Mo. Harrison 9-1846.

YOUR picture is worth 10,000 well-chosen words. Shooting scripts, narrations by FRED BAUER, 320 Bellaire Avenue, Fort Washington, Pennsylvania.

16mm FILM assignments—Chicago, Zoographic, Scenic, Industrial. ARLETTE STUDIO FILM PRODUCTIONS, 2754 N. Ashland Ave., Chicago 15, Illinois. BI 8-8612.

FILM assignments anywhere in India. B & W, color, 16/35mm. HARI DASGUPTA, 6 Southern Avenue, Calcutta 26.

FILM ASSIGNMENTS New York, Boston area, Scenic, stock shots, industrial. ACORN FILMS, 168 W. 46th St., N. Y. C. Judson 6-2272.

WEST GERMANY, 16mm films, still or sound. FRITZ BRUNS, (20b) Goettingen, Brauweg, 12.

LABORATORY & SOUND

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SOUND RECORDING at a reasonable cost. High Fidelity 16 or 35, Quality guaranteed. Complete studio and laboratory services. Color printing and lacquer coating. ESCAR MOTION PICTURE SERVICE, INC., 7315 Carnegie Avenue, Cleveland 3, Ohio. Phone ENdicott 1-2707.

If you have something new or used to sell producers or photographers of motion pictures, here is your best market place. Get your message before readers that are potential buyers, in the U.S. and over 80 foreign countries! See top of preceding page for rates.

PHOTOGRAPHIC ASSIGNMENTS

Continued From Page 632

CHARLES CLARKE, ASC, "Flaming Star" (Clover Prod.; C'Scope & DeLuxe color) with Elvis Presley and Dolores Del Rio. Don Siegel, director.

ARTHUR ARLING, ASC, "The Schnook" (C'Scope & Color) with Tommy Noonan and Barbara Eden. Charles Barton, director.

ELLSWORTH FREDRICKS, ASC, "Sanctuary" (C'Scope; Darryl F. Zanuck Prod.) with Lee Remick and Yves Montand. Tony Richardson, director.

ELLIS CARTER, ASC, "Wizard of Baghdad" (C'Scope & Color; Clover Prod.) with Dick Shawn and Diane Baker. George Sherman, director.

PHILIP LATHROP, ASC, "Hong Kong"* with Rod Taylor and Lloyd Bochner.

LLOYD AHERN, ASC, "Adventures in Paradise"* with Gardner McKay and Weaver Levy.

WARNER BROS. STUDIOS

JACK CARDIFF, "Fanny" (Mansfield Prod.; shooting in Marseilles) with Leslie Caron and Maurice Chevalier. Joshua Logan, director.

EDWIN DUPAR, ASC, "Hawaiian Eye"* with Anthony Eisley.

PEVERELL MARLEY, ASC, "A Fever in the Blood" with Efrem Zimbalist Jr. and Angie Dickinson. Vincent Sherman, director.

BURT GLENNON, "Lawman"* with John Russell.

ROGER SHERMAN, "Sugarfoot"* with Will Hutchins.

ROBERT HOFFMAN, "Roaring Twenties"* with Rex Reason.

RALPH WOOLSEY, ASC, CARL BERGER, ASC, "Maverick"* with James Garner.

HAROLD STINE, ASC, RAY FERNSTROM, ASC, ROGER SHEARMAN, "Surfside 6"* with Troy Donahue and Diane McBain.

CARL BERGER, ASC, "Bronco"* with Ty Hardin.

FLOYD CROSBY, ASC, HAROLD STINE, ASC, GLEN MACWILLIAMS, ASC, "77 Sunset Strip"* with Efrem Zimbalist, Jr.

MAURY GERTSMAN, ASC, Commercials*

HAROLD MARZORATI, ASC, Commercials*

THOMAS TUTWILER, ASC, Commercials*

ARTHUR FEINDEL, ASC, Commercials*

TECHNICAL TRENDS

in cinematic techniques

High Speed Photography

How a high-speed motion picture camera was employed to study the growth of microscopic bubbles during nucleate boiling will be described in a paper by J. E. Benjamin and J. W. Westwater, of University of Illinois, at the forthcoming International High Speed Congress of the SMPTE in Washington, D.C.

A Wollensak Fastax WF-15 camera with Goose controls and 1000-cycle signal generator was employed. The camera viewed through the metallographic microscope mounted horizontally and aimed through a thin glass window in the test cell. Magnification on the film was varied from 3x to 66x and arc illumination was supplied by 10mm rare-earth cored carbons operating at 30 amps. All equipment was mounted on railroad rails cast in concrete.

Usable motion pictures were obtained at 6000 frames per second with a 66x enlargement of the image on the 16mm negative.

Photography in Auto-translation

Photography, the recording medium that stores the greatest amount of information in the smallest space, is the key to success of the Air Force's new translating machine that changes Russian to English at the rate of 40 words per minute.

Key components in the process are special glass disks coated with a high-resolution photographic emulsion by Eastman Kodak Company.

An entire 55,000 word vocabulary thus may be stored in a ⅜-inch channel printed on the glass disks. The channel is scanned vertically and horizontally by electronics until the translating machine matches a Russian word—fed in with punched tape—to its English equivalent, which is then printed automatically on a typewriter.

New Optical Glasses

Twenty-six new types of optical glass have recently been added to the production catalog of the Schott Glass Works, which is virtually the exclusive supplier of glass to the West German camera and lens industry. The recent additions bring the total of available types of Schott optical glass to 232—said to be more than is offered by any other source in the world.

Magnasync-Magnaphonic

safari

mobile recording console

. . . a complete "sound truck" trailer!

SIDE VIEW

The "Safari" Console features the incomparable Magnasync Mark IX film transport and amplifier housed in a blimped console for both studio and mobile trailer operation. Three-channel mixer and recorder controls are packaged in removable remote unit. This elegant sound recording system is ruggedized and climatized, has plug-in audio elements and is completely self-contained with integrated power supply for cameras as well as the recording channel. Built-in "test lab" is provided for system performance testing.

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Frequency Response: 40 cps to 8500 cps ± 1.5 db (16 mm at 36 f.p.m.)
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